

Finish

THE MAGAZINE OF
Appliance AND
Metal Products MANUFACTURING



Architects: Perkins & Will, Chicago
 Porcelain Enamel: Ingram-Richardson,
 Beaver Falls, Pa.
 Photographer: Hedrich-Blessing, Chicago

another
 ARCHITECTURAL
 GEM
 in
 PORCELAIN
 ENAMEL

with color by *"Ceramic"*

The Home Office Building of the Lutheran Brotherhood in Minneapolis is the Twin Cities' most modern and most beautiful building. Its walls of shimmering blue-green porcelain enamel, in panels framed by stainless steel, will make it a landmark for many years to come. Remarkable for beauty, it is just as remarkable for economy, in erection and in

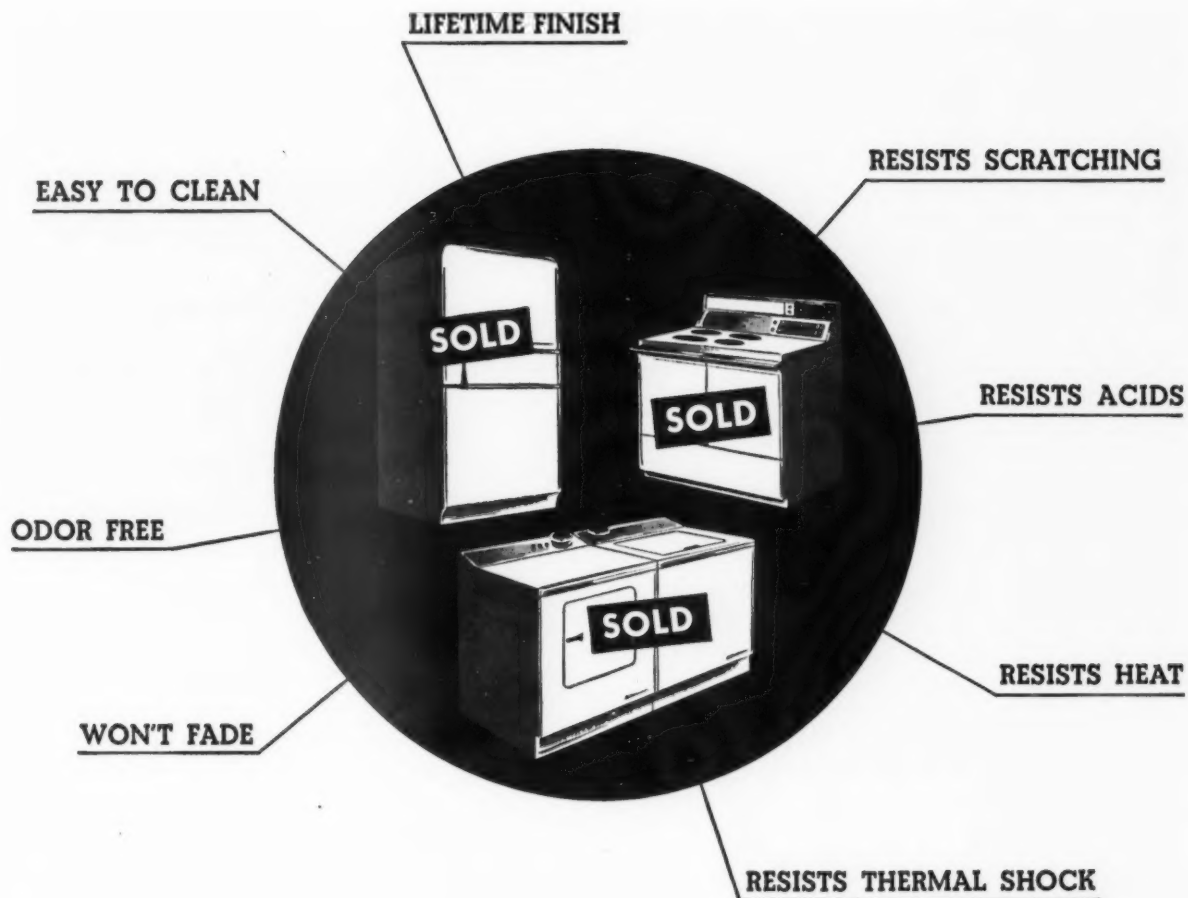
maintenance. Over 44,000 square feet of wall were installed in seven weeks; and the porcelain enamel is as easily cleaned as the glass in the windows.

"Ceramic" supplied the color for the panels . . . when color matching and color uniformity are of extra importance, it's always safe to depend on "Ceramic."

C-18



CERAMIC COLOR & CHEMICAL MFG. CO.
 New Brighton, Pa., U.S.A.



How Porcelain Enamel can put more SELL in your products

A porcelain enameled finish on your products can give you many powerful sales advantages. Porcelain enamel resists food acids, stains, scratches, and thermal shock. It won't burn, rust, or discolor, and is as easy to clean as a china plate. It's a lifetime finish that doesn't fade . . . stays color-fast.

To insure best results with porcelain enamel, a base metal with uniform flatness and bonding characteristics is needed. This is why Armco Enameling Iron has been specified by more porcelain enamelers over a longer period than any other base metal. Armco supplied the first sheets of this special metal more than 40 years ago. Since then it has become known as the "World's Standard Enameling Iron."

Let us send you our catalog on "Armco Enameling Iron." This informative booklet contains helpful tips on fabricating, welding, cleaning, pickling, and porcelain enameling. Just fill in and mail the attached coupon for a free copy.

ARMCO STEEL CORPORATION

1666 Curtis Street, Middletown, Ohio

Send us your catalog on "Armco Enameling Iron."

WE MANUFACTURE _____

NAME _____

COMPANY _____

STREET _____

CITY _____

ZONE _____

STATE _____

ARMCO STEEL CORPORATION

1666 Curtis Street, Middletown, Ohio



SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

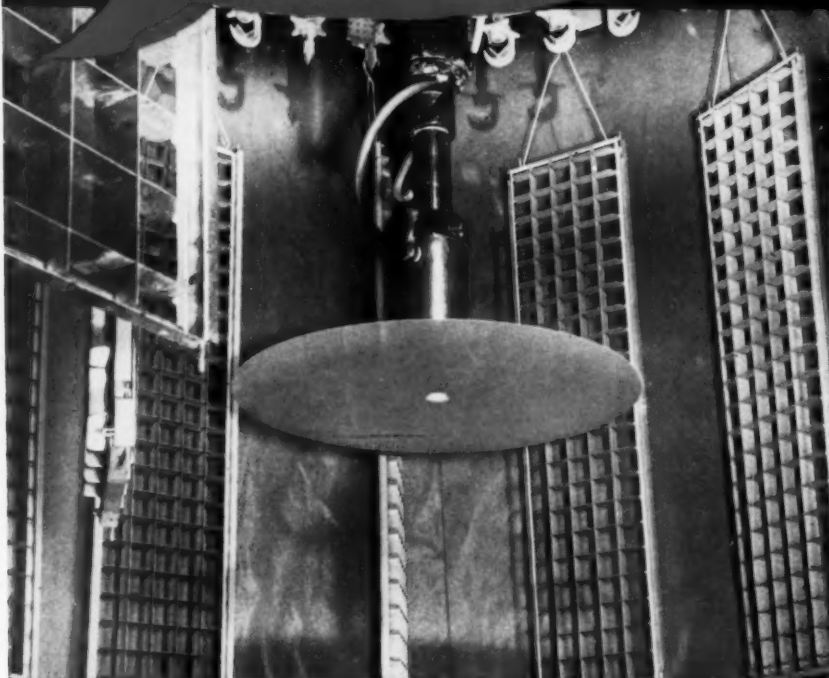
finish NOVEMBER • 1936

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LORD HALL LIBRARY

What d'ya mean . . .
**You're too little to use
 RANSBURG Electrostatic
 Spray Painting?**

If your production
 justifies conveyORIZED
 painting, chances are
RANSBURG NO. 2 PROCESS
 can do **YOUR** painting
 job better . . .
 at less cost.



RANSBURG NO. 2 PROCESS
 accounts for a 50% savings in paint
 costs in finishing fluorescent light-
 ing fixture parts for **MELROSE**
LIGHTING COMPANY, Phila-
delphia. Melrose is a small plant
 employing only 25 people.

Not only big industrial manufacturers like G. E. . . .
 Whirlpool-Seeger . . . Westinghouse and Republic
 Steel, but little plants, too, are using **RANSBURG**
NO. 2 PROCESS in their finishing departments to help
 keep mounting manufacturing costs in line.

A typical example is Melrose Lighting Company,
 Philadelphia. They make industrial fluorescent light-
 ing fixtures and employ only 25 people.

Formerly, according to F. Homer Hagaman, owner
 Melrose Lighting, when their fixture louvers were hand
 sprayed, they painted only 70 pieces per hour. Now,
 with Ransburg Electro-Spray, he reports they get over
 200 per hour.

Production on the fixture end parts jumped from 400
 pieces per hour by hand spray to over 2000 an hour
 electrostatically—a 400% increase!

Along with improving quality of the work, stepping
 up production, and cutting labor costs, Melrose is
 enjoying a 50% paint savings.

Let us show you how Ransburg No. 2 Process can
 lower **YOUR** painting costs. Write for our new No. 2
 Process brochure on electrostatic spray painting.
 Numerous production-line examples show how other
 manufacturers are cutting finishing costs . . . increas-
 ing production . . . and improving the uniformity and
 quality of their work with Ransburg equipment.

Ransburg **ELECTRO-COATING CORP.**
 Indianapolis 7, Indiana

RANSBURG

November • 1956

VOL. 13 • NO. 11

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EPA

NBP

finish

**METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT**

MACCO MACHINE CLEANER NO. 71-D

METAL SURFACE
PROTECTED
WITH MACCO
71-D
MACHINE
CLEANER

WITHOUT
71-D
PROTECTION

a phosphate cleaner and rust inhibitor
GIVES BETTER PAINT

ADHESION

**71-D prevents rust spread
and rust blisters**

A MACCO CASE HISTORY*

As in all fields today, purchasers of metal products are constantly demanding more and more in the quality of their paint finishes.

By far the most efficient and economical method of preparing metals for the finest and most enduring paint job is by use of Macco M.C. No. 71-D. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, Macco M.C. No. 71-D provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expensive and elaborate methods of preparation.

TESTED ADVANTAGES OF MACCO M.C. No. 71-D CLEANER

1. Cleans soil from metals and etches in one operation.
2. More economical because of longer life of solution.
3. Gives microscopic phosphate coating, greatly aiding in paint adhesion and corrosion resistance.
4. No special equipment required.
5. Never hardens in the drum.
6. Gives excellent protection against rust prior to painting.
7. Simple to control solution.
8. Can be run in conventional one, two, or three stage washers, as well as in other types.

Use Macco M.C. No. 71-D Cleaner and Phosphate Coating and add immeasurable quality to the finish of your product.

*Actual case history, names, etc. can be had by writing today to

LEADING METAL PROCESSORS

indorse its use for...

- CAMERAS
- TAPE RECORDERS
- TV CABINETS
- LAWN FURNITURE
- APPLIANCES
- MOLDING
- TOYS, Etc.

MACCO
PRODUCTS COMPANY

Makers of Better Metal-Working Compounds
Since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS



from the Editor's Mail

Printed circuitry article

Gentlemen: . . . want to congratulate you on the presentation of Mr. Kent's article on printed circuitry ("The Potential of Printed Circuitry in Major Appliances, C. F. Kent, Sales Manager, Croname, Inc., *finish*, October, 1956, Pages 28-31-34) . . . we would very much like to have several additional copies. . . .

R. G. Wagener
Croname, Inc.
Chicago, Ill.

Ed Note: Kent's exploratory study into the possible uses of printed circuitry in the major appliance field was first presented as a speech at an Institute of Appliance Manufacturers' national meeting. Of interest in December *finish* is an engineering report on printed circuitry in use—reporting on Cory Corp's utilization of a printed circuit in their commercial coffee pot.

Files world marketing article

Gentlemen: The article, "The World Can be Your Market," (*finish*, September, 1956, Page HL-10, by Whirlpool's Richard L. Morris) . . . is very interesting, and I am keeping it in my file. Thank you so much for sending it along. . . .

A. R. McGinnis
President and Treasurer
Klau-Van Pietersom-Dunlap, Inc.,
Milwaukee, Wis.

Opinions on "Snowstorm" promotion

Gentlemen: "You can make it 'Operation Snowstorm,'" (by C. R. Sample, Managing Editor, *finish*, Sept., 1956, Page 21) provokes some interesting thought. We in the stove industry could certainly use a November-December stimulant at the factory sales level. However, the "Snowflake" program comes so close after old-stove roundup activities that there might be some difficulty in getting major dealer merchandising emphasis immediately back into high gear, even with new models. In the final analysis, we would be asking ourselves some practical questions about the timing of the tool program and introduction of the new models to the assembly line. . . . Thank you for starting our thinking on this. "Operation Snowstorm" can turn into a major promotional program, and every avenue should be explored to maximize its effect. . . .

Jack Makemson
Executive Vice President
Geo. D. Roper Corp.
Rockford, Ill.

Gentlemen: The article is very interesting and, for your information, we are

finish NOVEMBER • 1956

tying our early November introduction of new models to the "Operation Snowflake" bandwagon. In fact, part of the promotion includes "Snowflake Specials." . . .

J. J. Anderson, Manager
Major Appliance Div.
Westinghouse Electric Corp.
Mansfield, Ohio

Gentlemen: The subject, of course, has received considerable discussion with some good arguments developed for each side. At the present time, it is still far from a final decision because of various marketing programs, production schedules, and fluctuating supplies of steel. I am requesting that our marketing managers keep this in mind. . . .

Robert H. Thomas
Manager-Public Relations
Hotpoint Co.
Chicago, Ill.

Gentlemen: . . . I think you already have noticed a trend in this industry to introduce new lines in the late summer and early fall months. This ties in with your thoughts as outlined. . . .

G. W. Burns
Easy Washing Machine Co.
Division of Murray Corp.
Syracuse, N. Y.

Gentlemen: Without question, your thought of synchronizing product announcements with the promotional impetus provided by the "White Christmas" promotion has a great deal of merit. . . . (However) with the many problems which are present at new product time for manufacturer, distributor, and dealer alike, there is serious doubt in my mind whether such a step as outlined in your editorial might not lessen participation. . . . My own inclination would be to suggest that the "Snowflake" promotion was serving a fine purpose in its present niche, but carried to the lengths you suggest, would upset an industry pattern that has proven very effective over the years. . . .

W. E. Saylor, Director
Advertising and Sales Promotion
Kelvinator Division
American Motors Corp.
Detroit, Mich.

Gentlemen: The point you make certainly is well taken. Frigidaire again this year will introduce its new appliances in mid-November. A number of our major competitors, I understand, are introducing even earlier than that. . . .

C. Carlton Brechler
Director, Public Relations
Frigidaire Division
General Motors Corp.,
Dayton, Ohio

Gentlemen: . . . We cannot argue that fall is the best sales promotional period of the year. Basically, we agree with your contention that fall introductions merit strong consideration in light of the powerful promotional stimulus "Snowflake" can offer. However, while

to Page 65 →

When the
reputation
of your product
depends on
critical
stampings
like these...



DE STA-CO
Stampings for
automotive distributors
and electric motors

Auto makers insist on trouble-free long-lasting performance of each component.

In turn, many component manufacturers supplying auto companies, look to Detroit Stamping Company for critical stampings, such as pictured above.

Their confidence suggests we would serve you well on your critical stamping assignments.

A brochure is yours for the asking!



**DETROIT STAMPING
COMPANY**

Established 1915

404 Midland Ave., Detroit 3, Mich.

"America's Leading Job Stamping Manufacturer"

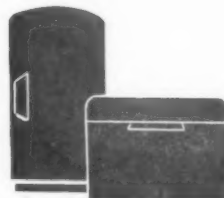
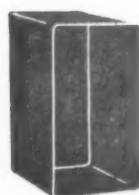
Look to Detroit!

It's time to take a new look at porcelain enameling!

FOR REFRIGERATORS AND HOME FREEZERS!

Automatic dipping and flow-coating equipment and new frits with smelted-in color are simplifying the porcelain enameling of food liners and storage pans, are raising quality standards while reducing costs. Ferro's Color Laboratory also is taking the guesswork out of color matching. These and other developments are narrowing the cost margin, making porcelain enamel ever more practical for refrigerator and home-freezer cabinets. Still other developments are on the way—one of which may add 20% to the capacity of your present porcelain enameling facilities.

CALL IN THE "FERRO TEAM" and let us tell you what is happening in porcelain enameling—in research, production, quality controls and automatic equipment. And we'll be happy to check your present production setup, tell you where you stand on costs. Remember: you get a *complete* service from Ferro. When and how can we serve you?

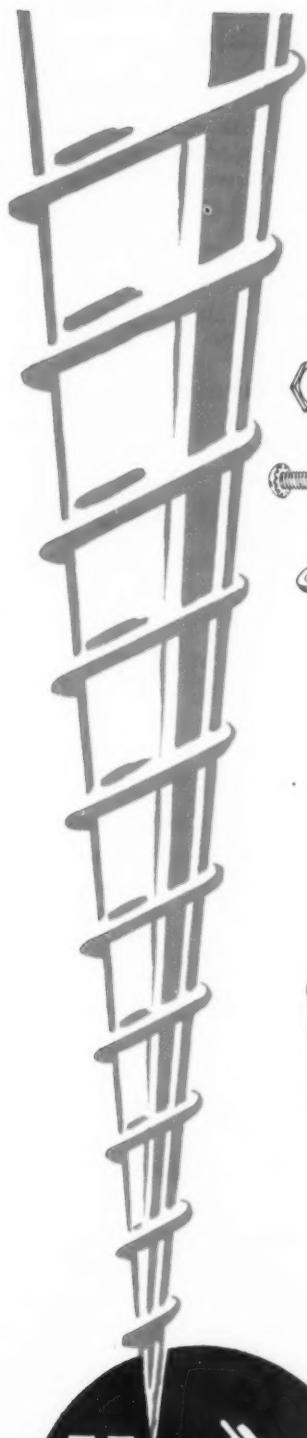


FERRO CORPORATION

CLEVELAND • NASHVILLE • LOS ANGELES

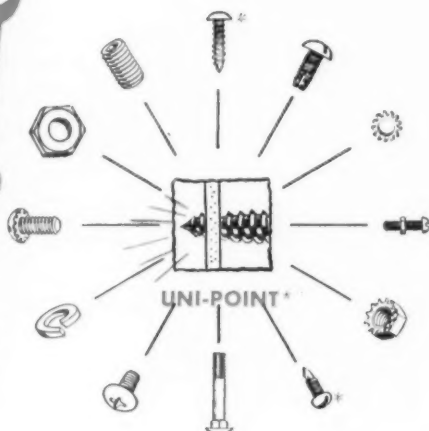
IN CANADA: FERRO ENAMELS (CANADA) LTD., OAKVILLE, ONT.

WORLD'S ONLY COMPLETE PORCELAIN ENAMELING SERVICE... including Plant Layout... Furnace Design and Construction... Product Design Assistance... Enamel Selection... Color Matching Service... Plant Start-Up Supervision... Production Trouble-Shooting... Cost Analysis Field Studies... Porcelain Enameling Materials and Supplies.



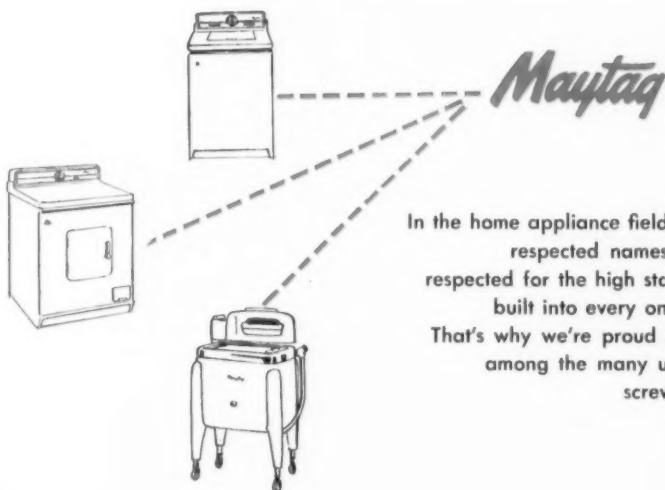
Universal Screws

ARE USED BY THE NATION'S LEADING
APPLIANCE MANUFACTURERS



Appliance manufacturers everywhere know that precision components help build quality products. That's why so many of these progressive companies use Universal screws and fasteners for a variety of needs.

AMONG THEM ARE SUCH TOP NAMES AS



In the home appliance field one of the most respected names is Maytag . . . respected for the high standard of quality built into every one of its products. That's why we're proud to count Maytag among the many users of Universal screws and fasteners.

*Pat. Pend.

UNI-POINT* is an exclusive new development by

UNIVERSAL SCREW COMPANY

MANUFACTURERS

precision quality fasteners for the appliance industry

2401 Brummel Pl., Evanston, Ill. — Davis 8-0450, Teletype Evanston, Ill. 1767

SALES OFFICES

DETROIT, MICH.
403 Curtis Bldg.
Trinity 1-2610

CLEVELAND, OHIO
6007 Euclid
Express 1-8181

MILWAUKEE, WIS.
204 Broadway
Broadway 2-1650

HOPKINS, MINN.
621 East Excelsior Blvd.
West 5-1060

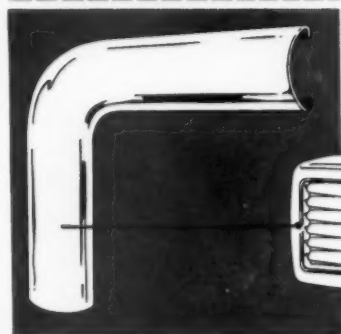


Custom Tailoring From a

Standard Shape

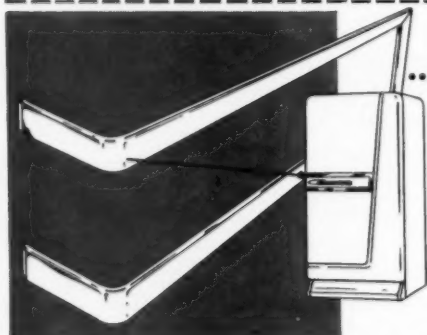
Pyramid Mouldings

Design Clinic



...AT NO TOOL COST

Standard sections can be custom tailored to combine *dollar savings* with *individual design*. For this heater, a standard Pyramid shape . . . combined with a standard radius bender . . . provided custom tailored trim . . . at *no tool cost*.



...AT LITTLE TOOL COST

As shown by this door panel trim, a simple addition to standard tooling can often custom tailor a standard shape to a specific application. Here an inexpensive bending fixture transformed a standard section into individual panel trim.

WRITE FOR YOUR FREE "PLAN BOOK OF METAL MOULDINGS"

For low cost, custom application . . . check your requirements against Pyramid's hundreds of standard shapes and, in many instances, standard bender fixtures and press dies. Send for Pyramid's "Plan Book" today.

Without obligation, please send copy of "Plan Book of Metal Mouldings."

Name _____ Title _____

Firm _____

Address _____

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.
NEW YORK... CALIFORNIA

MEETINGS

10th HOME LAUNDRY CONFERENCE

The Tenth National Home Laundry Conference, American Home Laundry Manufacturers Assn., Conrad Hilton hotel, Chicago, Illinois, November 1-2.

PEI SHOP PRACTICE FORUM

The PEI Shop Practice Forum, Urbana-Lincoln hotel, Urbana, Illinois, November 7-9.

NEMA ANNUAL MEETING

The National Electrical Manufacturers Assn., annual meeting, Traymore hotel, Atlantic City, N.J., November 12-16.

ASRE SEMI-ANNUAL MEETING

The semi-annual meeting, American Society of Refrigerating Engineers, Boston, Massachusetts, November 25-28.

ASME ANNUAL MEETING

The American Society of Mechanical Engineers, annual meeting, Statler and McAlpin hotels, New York, N.Y., November 25-30.

AIR CONDITIONING MEET

National Warm Air Heating and Air Conditioning Association's Committee and Annual Convention, Netherland Plaza hotel, Cincinnati, Ohio, November 27-30.

NAMA 1956 CONVENTION-EXHIBIT

The 1956 convention-exhibit of the National Automatic Merchandising Assn., Conrad Hilton hotel, Chicago, Ill., December 2-5.

JANUARY HOUSEWIVES EXHIBIT

The National Housewares and Home Appliance Manufacturers Exhibit, Navy Pier, Drill Hall, Chicago, Illinois, January 17-24.

AIEE GENERAL MEETING

American Institute of Electrical Engineers General Meeting, Hotel Statler, New York, N. Y., January 21-25.

IHEA MEETING

Industrial Heating Equipment Association, Inc., Meeting, Washington, D. C., January 28-29.

NESA ANNUAL CONVENTION

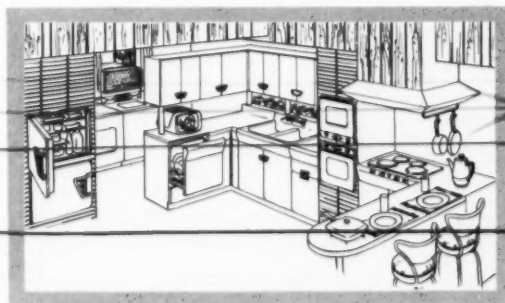
The National Electric Sign Assn., annual convention and exhibit, Sheraton Park, Washington, D.C., Feb. 17-20.

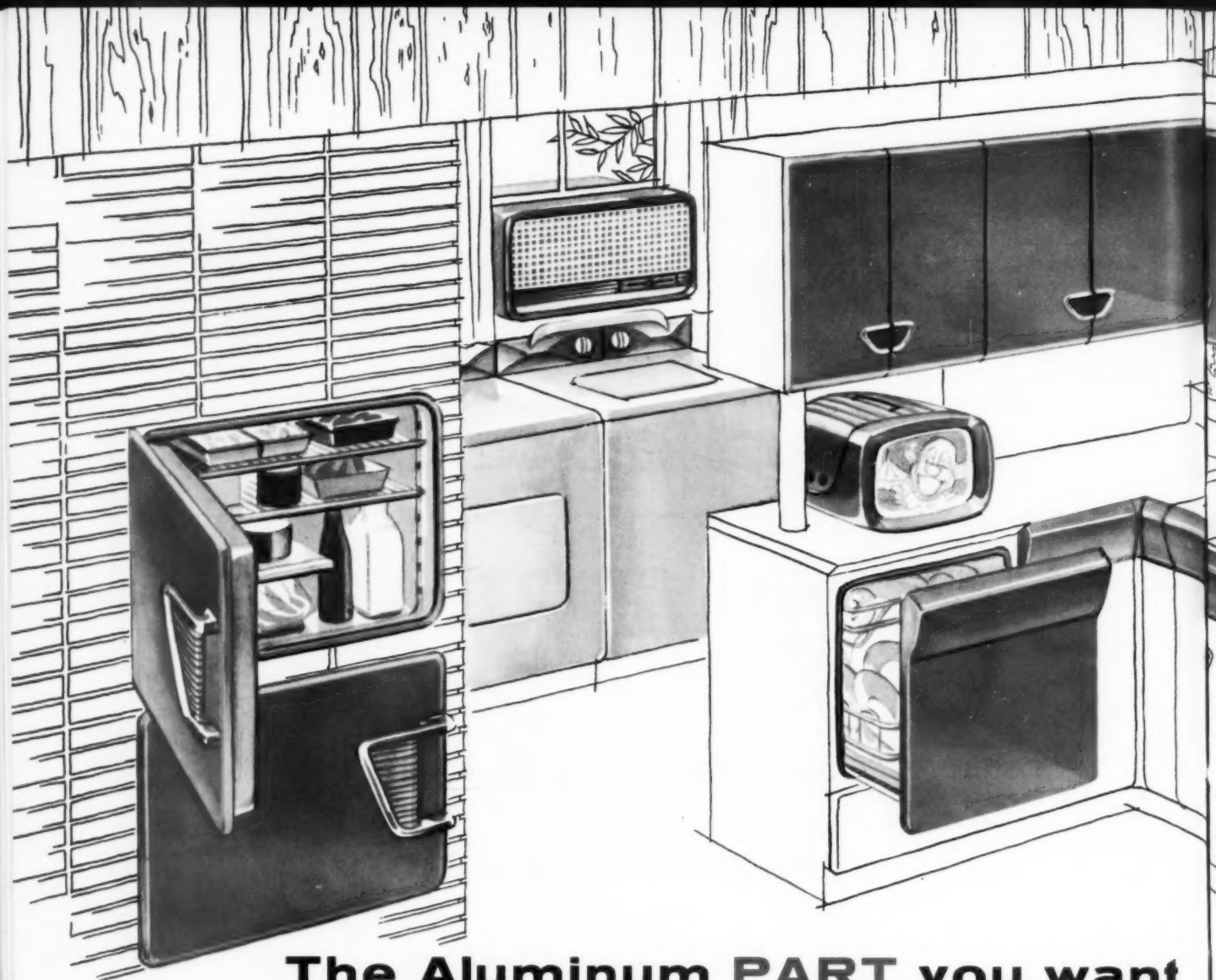
NOVEMBER • 1956 finish

**for exciting
sales appeal...**

**for the finest in-the-metal
finishes and colors on your
appliance parts**

**rely on REYNOLDS ALUMINUM
FABRICATING SERVICE**



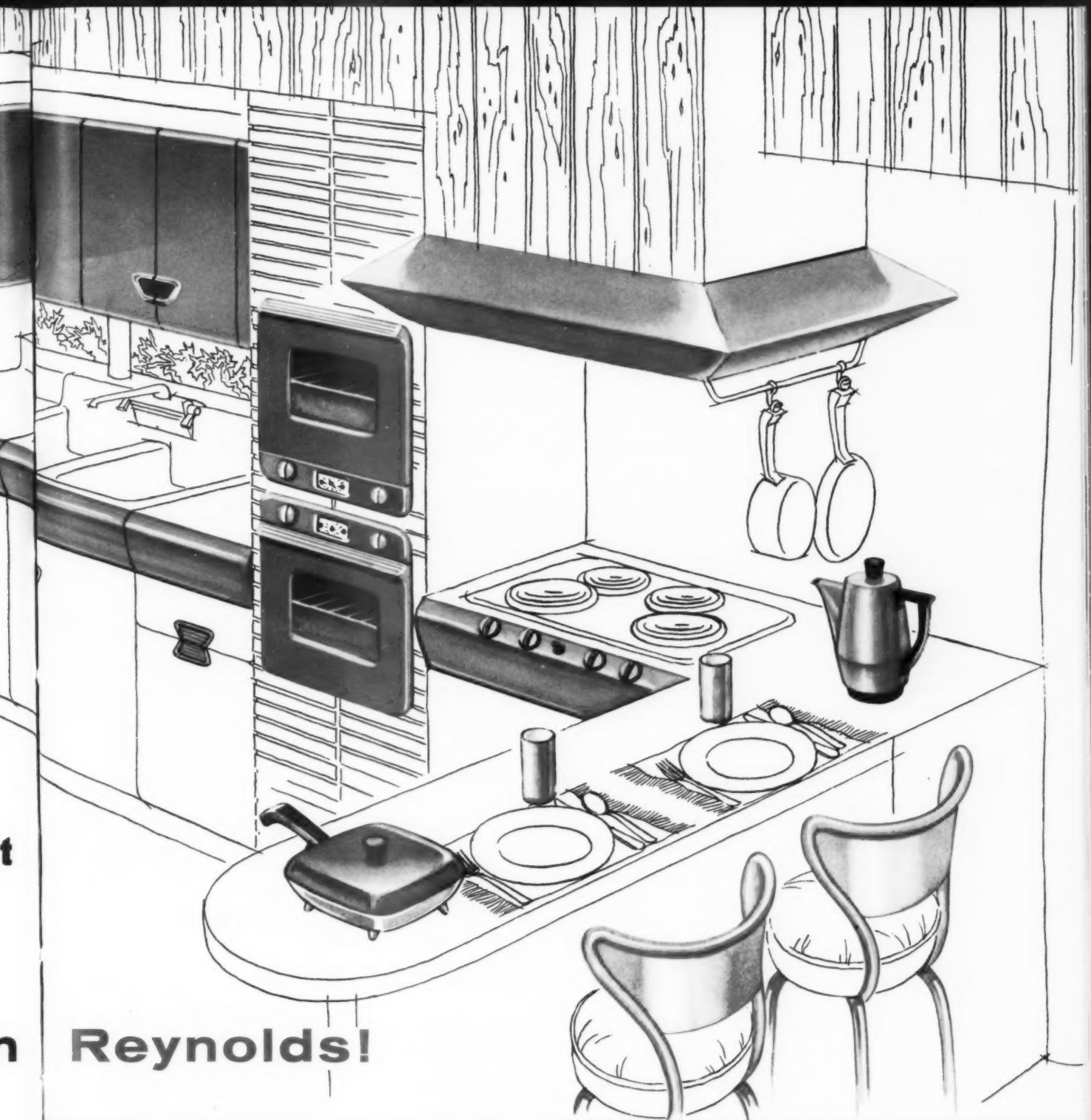


**The Aluminum PART you want
The FINISH you want
The COLOR you want
You can get them all from**

**The newest in beauty and styling is combined
with the latest in engineering in aluminum parts produced by
Reynolds for both conventional and built-in appliances.**

Rich copper colors . . . deep or pastel blues
. . . luxurious golds—or the colors of your
choice in a variety of shades and a variety
of finishes can be produced by Reynolds
Aluminum Fabricating Service to help *move*
your fine appliances.

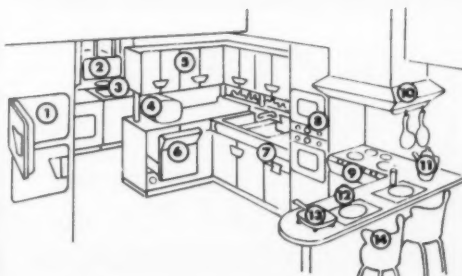
There are good reasons for relying on
Reynolds Aluminum Fabricating Service
for fabricating and finishing your aluminum
appliance parts. These reasons are spelled
out on the back page of this insert. It may
pay you well to consider them.



Reynolds!

Key to Aluminum Parts in Above Sketch

- 1 Refrigerator-Freezer Built-In Unit—copper anodized doors, gold and blue anodized interior parts
- 2 Room Cooler Cabinet Front—gold and blue anodized
- 3 Washer and Dryer—gold and blue anodized
- 4 Portable TV Cabinet—copper anodized
- 5 Kitchen Cabinet Doors—copper anodized
- 6 Dish Washer Door—copper anodized



- 7 Cabinet Trim and Drawer Fronts—copper anodized
- 8 Oven Doors for Built-In Unit—copper anodized
- 9 Control Panel for Built-In Table Top Range—copper anodized
- 10 Hood for Built-In Table Top Range—copper anodized
- 11 Coffee Maker—copper anodized
- 12 Tumblers—blue anodized
- 13 Fry Pan Cover—copper anodized
- 14 Furniture Tubing and Backs—blue anodized

NOTE: Parts shown can be fabricated by Reynolds and offered in a variety of finishes and colors.



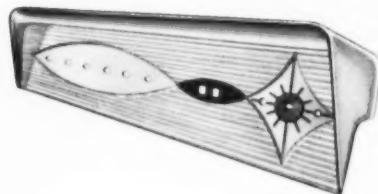
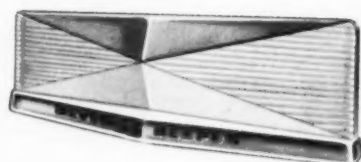
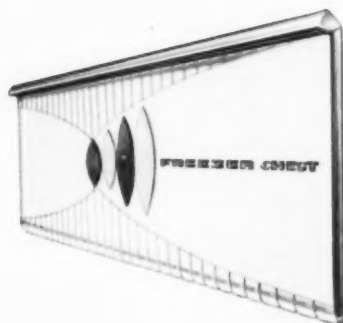
VAST FABRICATING FACILITIES, experienced design and engineering assistance and quality control from mine to finished product are three good reasons why it pays to rely on Reynolds Aluminum Fabricating Service for production of aluminum appliance parts.

And—Reynolds can supply these parts with the *finish* you want and in the *color* you want because Reynolds greatly expanded finishing facilities are unsurpassed anywhere. Reynolds tremendous investment in today's latest automatic finishing equipment assures you finer finishes on the aluminum parts you design . . . gives you new flexibility in your design thinking. And Reynolds years of technical experience with practically every finishing process and technique applicable to aluminum go hand in hand with these facilities.

- Rely on Reynolds for *color anodized* finishes in gleaming colors of your choice—in-the-metal finishes that will never pit or chip or flake or tarnish.
- Rely on Reynolds for *clear anodized* finishes with the mellow luster and the "look of sterling".
- Rely on Reynolds for many other finishes on your aluminum parts including mechanical, chemical and paint film.

For the highest quality from "start to any finish", let Reynolds fabricate and finish your aluminum parts.

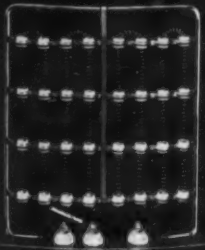
For full details on Reynolds fabricating and finishing facilities, contact your nearest Reynolds Branch Office or write *Reynolds Aluminum Fabricating Service, 2003 South Ninth Street, Louisville 1, Kentucky.*



REYNOLDS ALUMINUM FABRICATING SERVICE

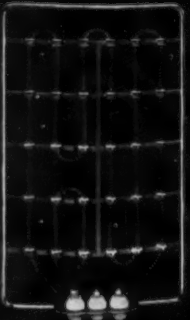
BLANKING • EMBOSSING • STAMPING • DRAWING
RIVETING • FORMING • ROLL SHAPING
TUBE BENDING • WELDING • BRAZING • FINISHING

$$\text{TEP} = \frac{\text{Minimum}}{\text{Micro Amp. Leakage}} + \frac{\text{Long Life}}{\text{Low Maintenance}} = \text{Top Quality}$$

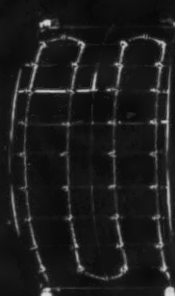


A Maytag Automatic Clothes Dryer Unit


There are good reasons why a big majority of the appliances on the market today, that include electrical heating elements, are equipped with TEP products. Perhaps one reason is that we specialize in the open-coil heating element business and we like to believe have the necessary know-how to serve this field efficiently. Whenever you have a heating or intricate wiring problem we suggest you contact us for a possible solution.



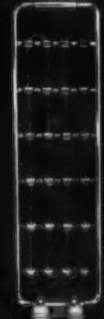
A TEP Manufactured Unit for an ABC Clothes Dryer



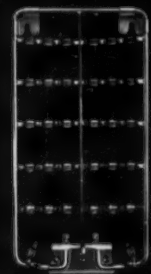
TEP "Floating Construction" is also included in the Lovell Dryer System



Rheem Wedgewood Dryer is equipped with this exclusive heating element



Norge Automatic Clothes Dryer — TEP-Built Element



Oven Unit Engineered for Florence Stove Company

They're Equipped with **TEP** "Top Quality"

DESIGN AND ENGINEERING ASSISTANCE

When developing new or improving old units, we suggest you take advantage of free TEP engineering and design service. Call in a TEP representative early in your planning program. There is no obligation.

OPEN COIL HEATING ELEMENTS

Floating frames that eliminate rigidly welded construction and permit elements to breathe, TEP Steatite Insulators that reduce micro-amp leakage and Sure-Lock Insulator Supports that will not dislocate or cause electrical failures, are three reasons why TEP design for open-coil heating elements assure top quality and peak performance. These are TEP exclusive features, found in no other heating element, that insure long service life and low maintenance.

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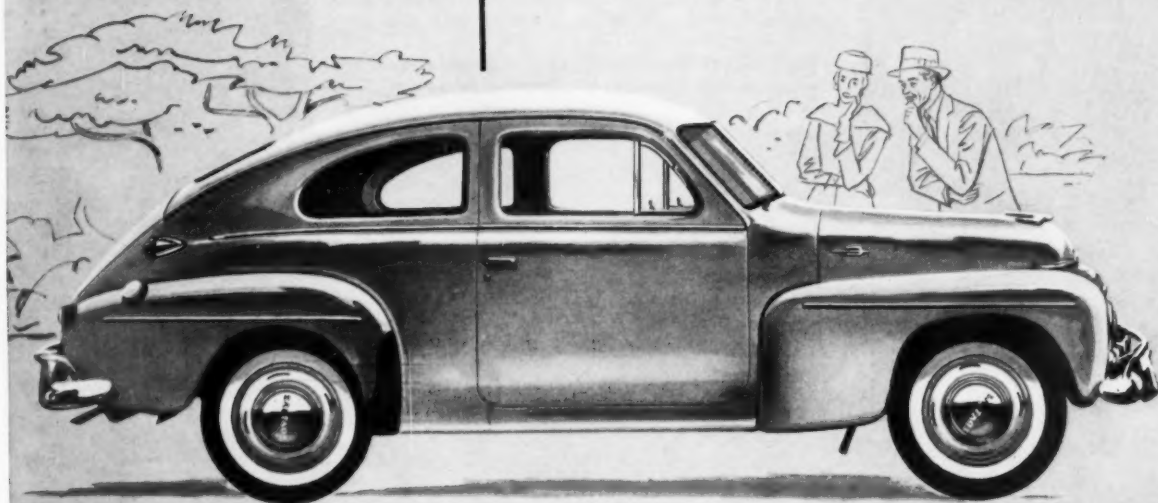


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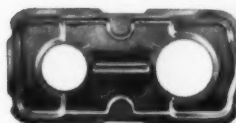
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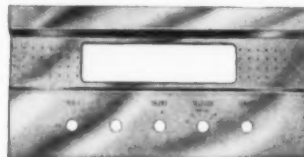


Aerator pans, oven and rotisserie linings, back rail trim, stove doors and tops and broiler pans are customer appealing, sales creating features when made from APOLLO

satin or bright finished tarnish-resistant ChromSteel.



There's nothing as effective as the gleaming appearance of APOLLO Pre-Finished ChromSteel to sell certain types of food service equipment. Sturdy, tarnish-resistant, easy to work, weldable, APOLLO ChromSteel permits a finer job at a fraction of the cost of piece finishing, while greatly increasing production.



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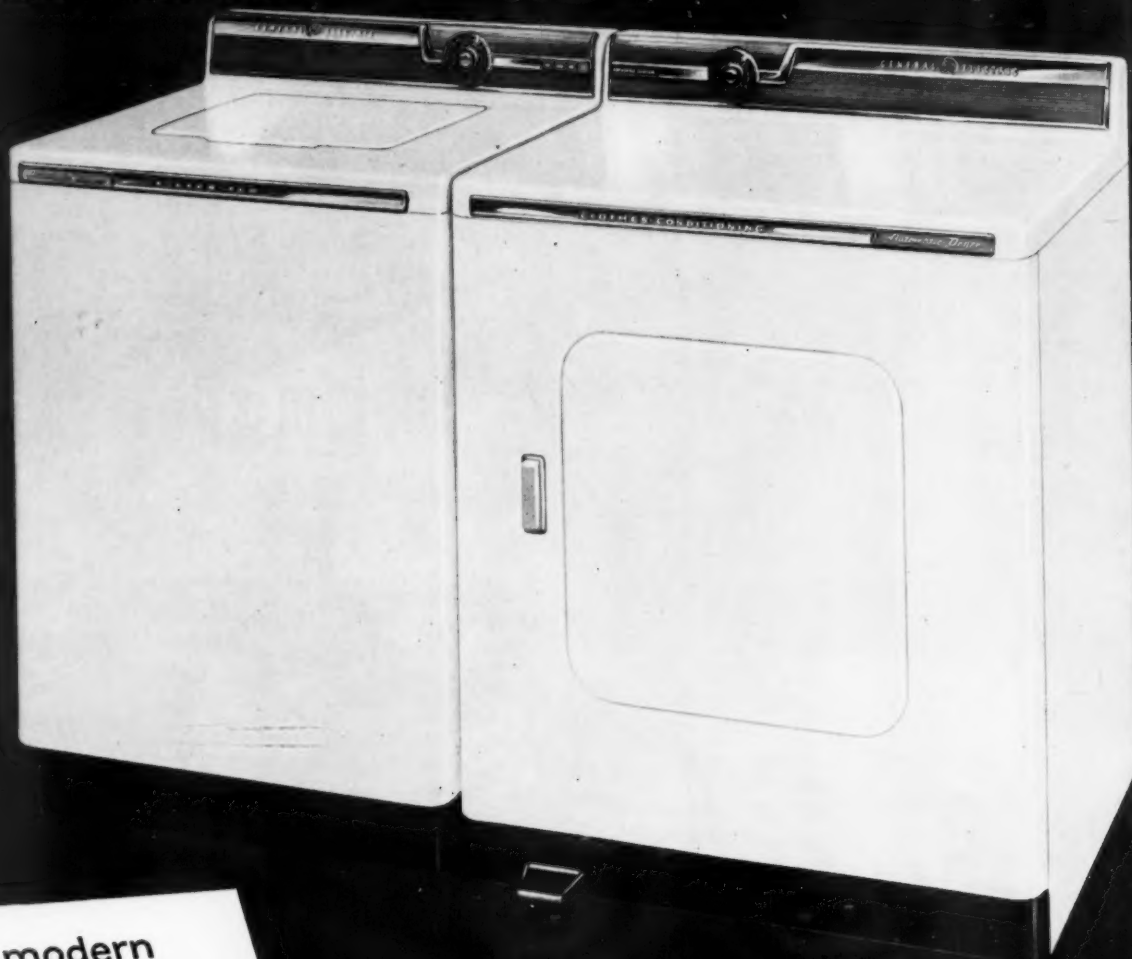


Roper's "Mrs. America" gas range, has the "Tem-Trol" automatic top burner that holds any pre-set heat within 2 degrees. Automatic oven controls, a smokeless broiler, clean high styling, are just part of the features that are being offered the American homemaker this year by the Roper Corporation.

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New G-E Washer and Dryer give you
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On modern
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DULUX[®] Enamel finishes first in sales appeal...resistance to marring



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**America's leading
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Over 53,000,000 major home-appliance units now
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AN APPLIANCE FINISH that dependably resists harmful effects of soaps, detergents and heat naturally gives modern washers and dryers added sales appeal. And that's only *one* of the sales-winning properties of durable Du Pont DULUX Enamel.

Constant research by Du Pont chemists has resulted in a finish that ruggedly resists chipping, cracking, scratching and staining. Application costs are lower with DULUX without sacrifice of quality appearance or performance.

DULUX keeps its first-day new look even after years of use in the home. Its longer-lasting whiteness, resistance to wear and easy cleanability help insure the continued customer satisfaction that's so important to the success of any appliance line. No wonder so many of today's topflight appliance manufacturers use Du Pont DULUX Finishes.

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When press costs climb fast put Youngstown sheets and strip on the job



Are rising production costs haunting your press shop? If so, why not specify Youngstown Cold Rolled Sheets and Strip and give a healthy shot-in-the-arm to your drawing and stamping operations. Satisfied users all over the nation tell us the same story: "Our production is up—Rejects are down!" This gives an over-all cost reduction which looks mighty good to any front office.

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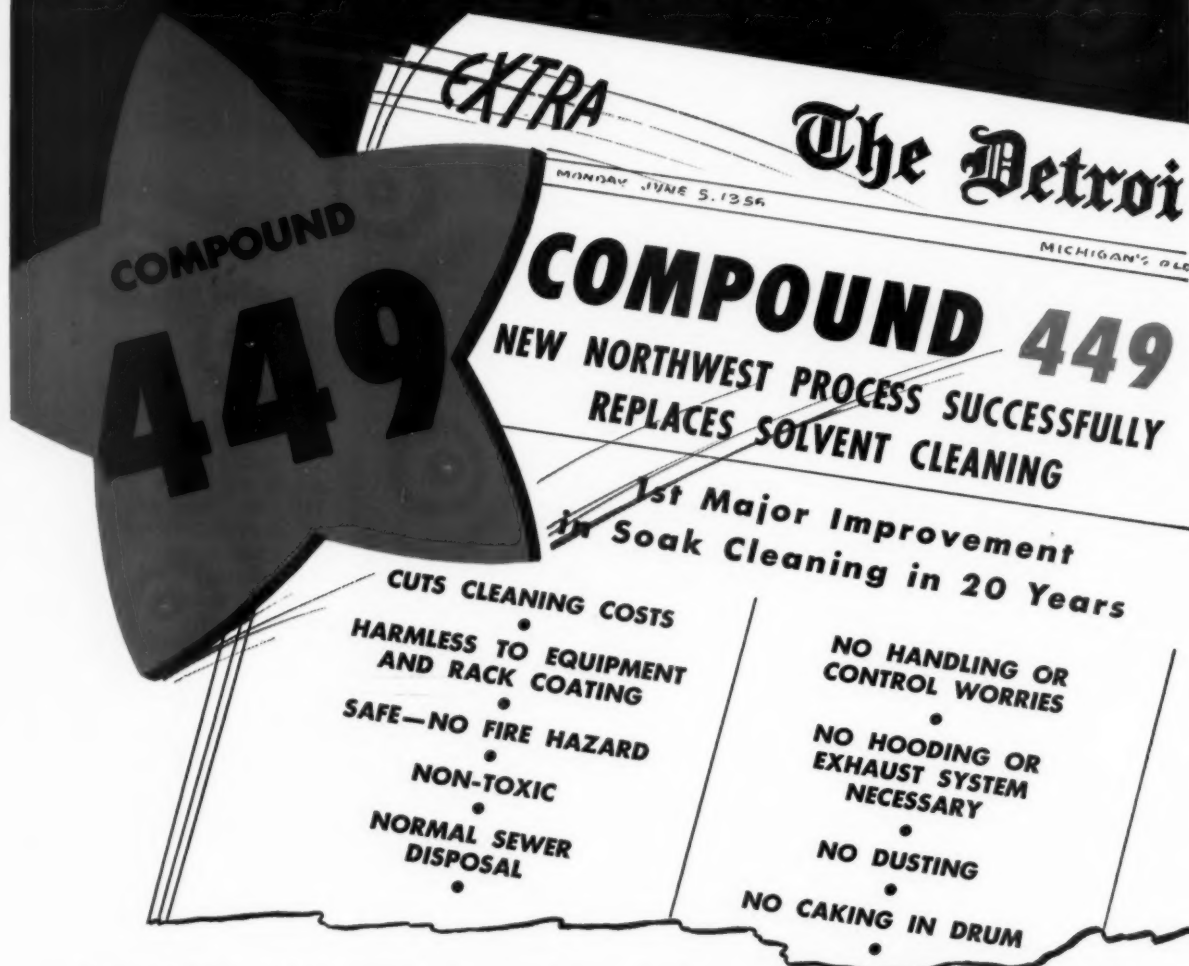
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449 is an unusually efficient soak cleaner, specially developed for preparing non-ferrous metallic surfaces for plating and finishing operations. 449 has unusually long bath life and wide application range . . . costs no more than ordinary cleaners.

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REFRIGERATOR HARDWARE DIVISION

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This slogan adopted in 1910 when PEERLESS was founded is in all truth a fact. Pleasing customers in any field is important, particularly so in the wire goods field. This is the reason that through the years PEERLESS has been privileged to retain the friendship and business of its customers.

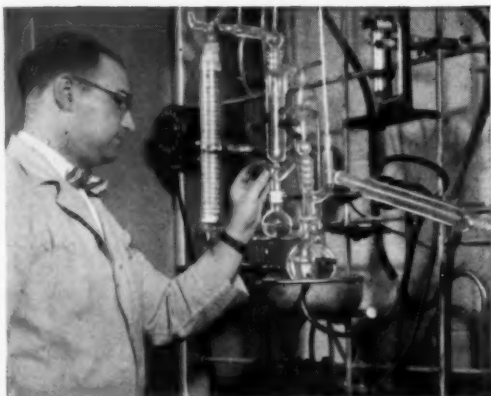
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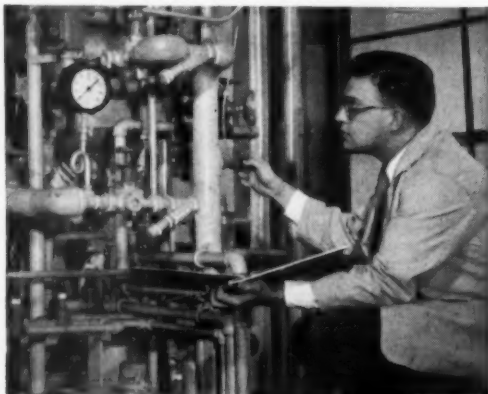
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WIRE GOODS COMPANY, INC.
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Use the skill and know-how of Pittsburgh's 415 Finishes Technologists



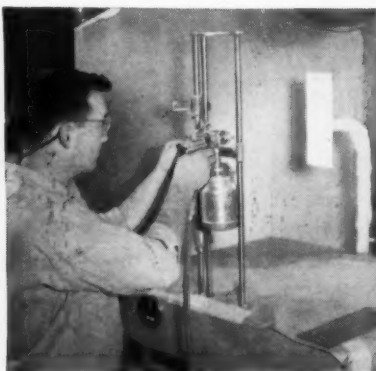
• Often one of the first steps in solving a special coating problem is synthesis of a new compound or a new resin. Pittsburgh's modern Paint Research Center is equipped with the most modern facilities for such work.



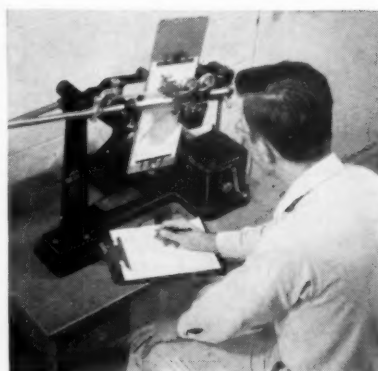
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They'll help you develop better finishes for today's products . . . special finishes for tomorrow's goods—without adding to your payroll!

THE CONSTANT STREAM of new and improved products brings with it demands for finishes with more exacting requirements than ever before. Some of these can be solved with existing formulations. Others require completely new chemical compositions to provide new standards in adhesion, toughness and resistance to corrosion.

• To help you get finishes that meet your most critical specifications, Pittsburgh now offers you the most modern facilities for fundamental and applied research in the paint industry. In its new Paint Research Center at Springdale, Pa., and in the development laboratories of its 11 paint plants, Pittsburgh maintains a staff of 415 chemists, engineers and technicians. Here new materials, products, processes and application techniques combine in a program of progress to maintain Pittsburgh's traditional leadership in the field of surface coatings.

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H. P. MUELLER, President

They Make The Weather Behave

From the heart of industrial America comes this special report—the first complete story of Mueller Climatrol operations ever published.

◆ You'll hear how management plays its part, and how engineering, production and sales are wedded into a team that keeps "on top of the market" at every turn. Design and engineering operations—featuring the '57 Climatrol line—will be given thorough study.

◆ You'll see how every piece and part of the new models are engineered. The complete details of manufacturing, welding, finishing, assembly and packaging, will be presented in detailed reports by the men who direct the operations.

The story of assembly will carry you

right into a customer's home where—in the Mueller system—final assembly is a part of the installation. And *finish* photos and *finish* editorial reports will explain every step of the way.

◆ You'll hear the details of Mueller Climatrol's unusual customer service program, of their sales training "crash program", and you'll meet the executives that are the heart of this 100-years-of-progress company.

February '57 *finish* salutes 100th Anniversary Celebration

Its all part of the big February '57 issue of *finish* that will salute Mueller Climatrol Company on their 100th anniversary activities.

And February's *finish* is ideal advertising climate . . . an issue that will be distributed from Mueller's booth at the International Heating and Air Conditioning Exposition, Feb. 25—March 1 . . . an issue that every key man at Mueller Climatrol (and all of Mueller's competitors) will read with special care.

finish for February . . . you can't afford to miss having your message included. Space reservations close January 10. Write, wire, or call now for your special "They Make the Weather Behave" folder. Read all the details about this special feature.

the magazine of appliance and metal products manufacturing
York Street at Park Avenue Elmhurst, Illinois



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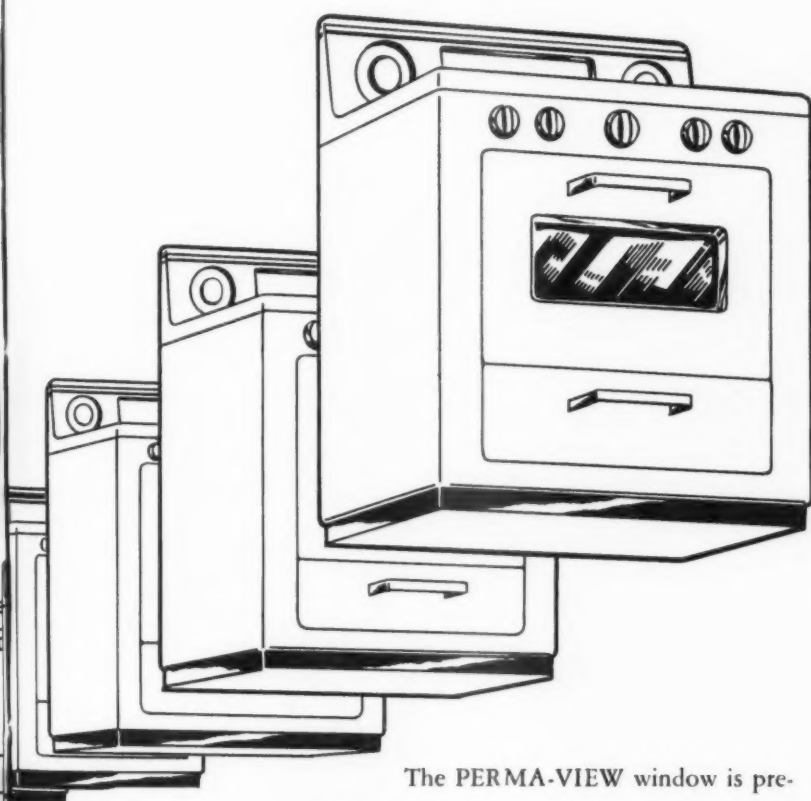
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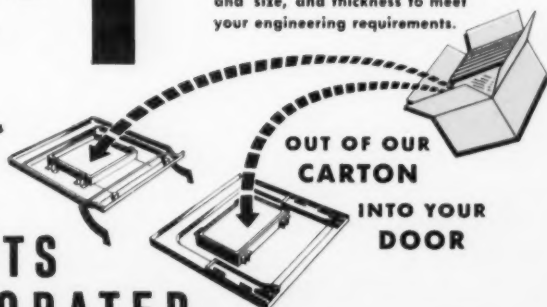
PERMA-VIEW oven door windows are fast becoming standard with leading range manufacturers in the United States, from Coast to Coast. Now, leading manufacturers in other countries are learning the sales advantages of the PERMA-VIEW "No-Fog" window too.

(Accompanying names and trademarks represent some of the present users outside the United States.)



The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range. "Out of our carton into your door." With PERMA-VIEW you get "a window you can see through always." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.

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of attachment
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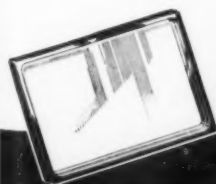


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We can manufacture any shape, and size, and thickness to meet your engineering requirements.



MILLS PRODUCTS INCORPORATED

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Covercoats by **PEMCO**

put that "I enjoy it" look
in housewives' eyes

Cooking becomes a real pleasure in a kitchen equipped with today's modern, handsome appliances. An important feature in selling major appliances today is the finish that keeps them new looking for a lifetime. Pemco Covercoat porcelain enamels give your sales department this important feature.

Your production department gets what it wants, too . . . built-in versatility that permits wider tolerances in thickness of spray coatings . . . uniform results under variations in firing temperature and furnace loads . . . and excellent color matching which reduces reject percentages. It all adds up to economical production and better profits.

Ask the Pemco sales engineer who calls on your company for complete information on Pemco Covercoats and the many advantages they offer.

Color motion picture, "Everything Under Control" available on request.
Runs 28 minutes. Write:



PEMCO

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ROASTING *NOW* AUTOMATICALLY CONTROLLED

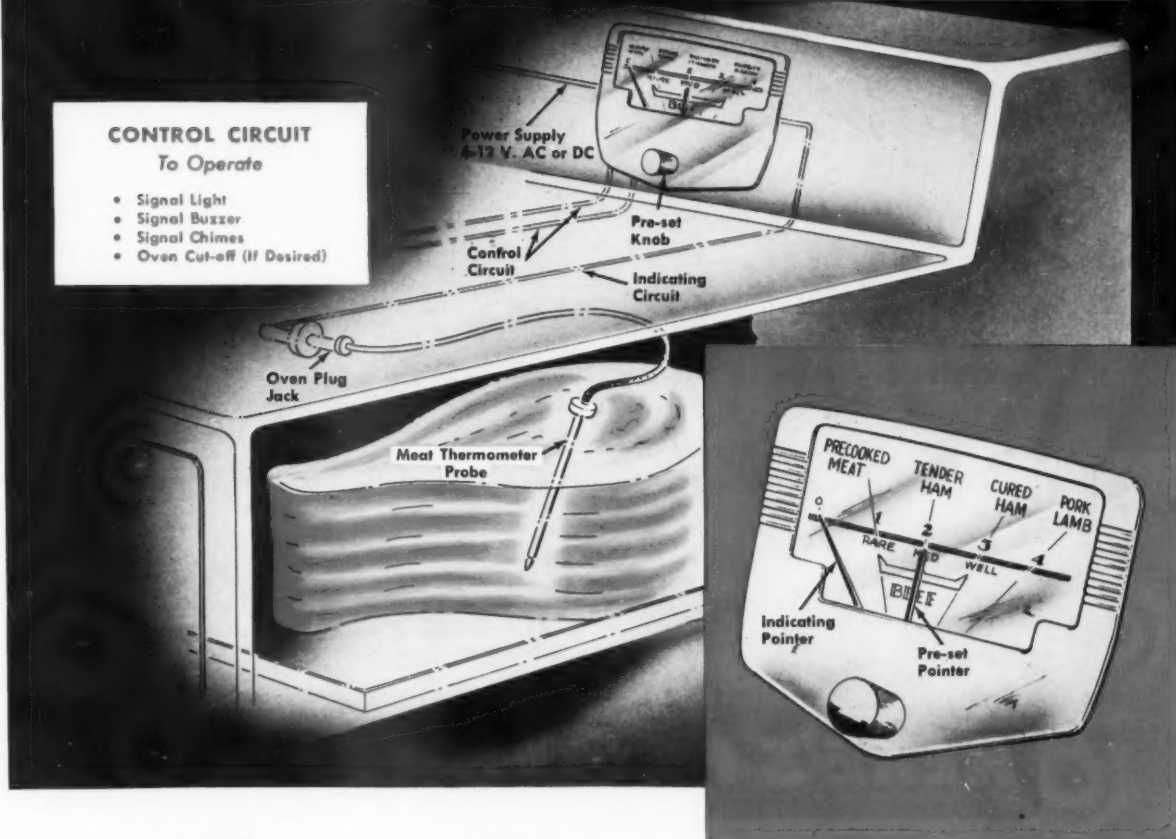
ANOTHER
NEW

KS

DEVELOPMENT

CONTROL CIRCUIT To Operate

- Signal Light
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Last year, the K-S Electric Meat Thermometer made news by outmoding the stoop, squint and guess routine for roasting. Its indicator, in full view on your range instrument panel, gives the cook reliable information on the progress of the roasting cycle until it is finished to a "turn", fit for the most discriminating epicure.

Something New has been added—AUTOMATION

When the roast or fowl goes into the oven, the cook sets a pointer on the instrument to exactly the degree of doneness she desires. As roasting proceeds, a

second pointer moves up indicating the progress of the roasting cycle.

When this indicating pointer reaches the set point, a signal notifies the cook. In addition, if you desire, it will turn off the oven. Thus the cook can devote her full attention to other matters without jeopardizing the perfection of her main dish.

Consider for yourself the value and sales appeal of this new K-S development. Include it in your range.

7501

KING-SEELEY CORPORATION
ANN ARBOR, MICHIGAN

KS

EPON RESIN does it!

Tough primer on RCA WHIRLPOOL Washers

withstands rugged
washday punishment



RCA WHIRLPOOL Washer cabinets on storage conveyors. Finish system includes an Epon resin undercoat, formulated by Grand Rapids Varnish Corporation.



Epon resin-based finish plus careful inspection eliminate customer complaints.

HERE'S HOW...

SOAPS AND MODERN high-strength detergents are persistent enemies of ordinary paint. Because of severe corrosive conditions in some geographical areas, home laundry appliances often show rust stains in just a few weeks of service.

Whirlpool-Seeger Corporation, St. Joseph, Michigan, has found that a primer based on Epon resin gives an outstandingly superior protective finish to its washers, driers, and other home laundry equipment. To maintain the highest standards for coatings, Whirlpool-Seeger set up a system of continuous quality-control testing in their finishing section.

Epon resin-based primers, now standard on RCA WHIRLPOOL Washers, are credited with all but eliminating a major source of field complaints about coating failures.

If you have a product finishing or paint maintenance problem, you, too, may find that Epon resin-based coatings will do the job better. They have excellent adhesion, high resistance to impact and abrasion, outstanding resistance to moisture, heat, and corrosives. Ask your supplier for Epon resin-based paints and enamels. Write for the full Epon resin coatings story: "Planning to Paint a Pyramid?"

Epon resins are the epoxy polymers made exclusively by Shell Chemical Corp.



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"A typical air conditioner to cool an entire house consumes the power of 24 refrigerators while operating. About 350 pounds of copper is needed in the utility system to supply one such unit with power. In the face of this increase in power supply problems resulting from our industry's products, it is comforting to see the aggressive and determined measures being taken by the various utilities to prepare for the business to come."



Figure One

Refrigerant circuit and operating conditions of typical year round residential air conditioner explained. Need for custom built motors for industry analyzed.

THIS PAPER will deal with *single phase* residential air conditioners. In a somewhat elementary way, I wish to discuss compressor motor horsepower. This figures prominently not only in the design of motors and controls for home air conditioners, but also in the provisions of many codes. Because the same motor components will give vastly different performance if they are used in a compressor than in a standard open motor, much confusion has resulted.

Horsepower as a technical unit of energy consumption has a simple clear meaning: 33,000 foot pounds per minute. As a description of a standard open motor, it is a little less clear—a 3 hp standard motor is one which will deliver up to about 3.45 hp. As a description of hermetic compressor motor, it is so

vague we are frequently asked, "What is an air conditioning horsepower?" The situation has not been helped by many in our industry who advertise more cooling for the same money by trick use of the word "horsepower", which has only the vaguest connections with ability of the unit to cool. The horsepower of the compressor motor, nominal, actual, or fancied — high or low — is of no benefit to the customer. He is buying cooling capacity.

We will now discuss the following: (a) A simple explanation of the refrigerant circuit and operating conditions of a typical year-round residential air conditioner. (b) Factors affecting the horsepower an air conditioning compressor

must furnish, and reasons why the home air conditioner market must have compressor motors custom built to its needs. (c) Bad results arising from the attempt to force these custom motors to act like standard open motors by designing codes and rules for them around old open motor practices.

We recommend that the entire practice of setting up code provisions and starting current limitations in certain steps corresponding to open motor performance be abandoned. We should work together to show accurately the air conditioner's electrical characteristics on its name plate to guide the installer and the utility. These should include starting current and a high-normal current defined by joint industry action.

to Page 30 →



FIG.-3

HORSEPOWER CONTINUED

No penalty should be attached to an air conditioner because the figures on its name plate do not correspond to figures in a table. This procedure will permit us to put all the engineering facts on the table, yet completely meet the needs of the air conditioning field.

Figure 3 shows a typical year-round system for heating and air conditioning a home. It has four main elements: A forced air furnace, a cooling coil mounted above the furnace, a waterless condensing unit containing most of the refrigerant machinery and located outdoors, and a year-round thermostat which maintains the desired temperature winter and summer—automatically operating the furnace or an air conditioner as needed.

Economy design

This system requires little floor space in the home, uses no water whatever, is quiet and economical in operation. We feel this basic type will meet the bulk of the market requirements for some years to come. The electrical components previously shown in Figure 1 are parts of this equipment.

Figure 4 is a refrigerant circuit diagram for a typical home air conditioner.

In this circuit the compressor with its electric motor is a pump which pumps refrigerant gas from a low pressure and temperature (about 40°F. as it returns from the cooling coil) to a higher pressure and temperature (about 180° to 250°F.)

Methods of heat removal

The hot gas leaving the compressor contains all the heat removed from the cooled space plus the heat of compression. This heat can be discarded in several ways, but two methods are commonly used. In the method shown in the left circle, the hot gas is led into a condenser and cooled by a water coil. The heated water is then led to an outside cooling tower where it is sprayed past moving air and cooled before being recirculated to the condenser.

This method has the advantage of giving a somewhat lower pressure for the compressor to work against. But it has serious problems for the residential market—corrosion and maintenance, filling and draining as the seasons change, water connections, etc.

The other main method for disposing of condenser heat is shown on the right circle of Figure 4. The hot gas is led directly to a so-called air cooled condensing unit located outside the house.

METHOD FOR DISPOSING OF CONDENSER HEAT

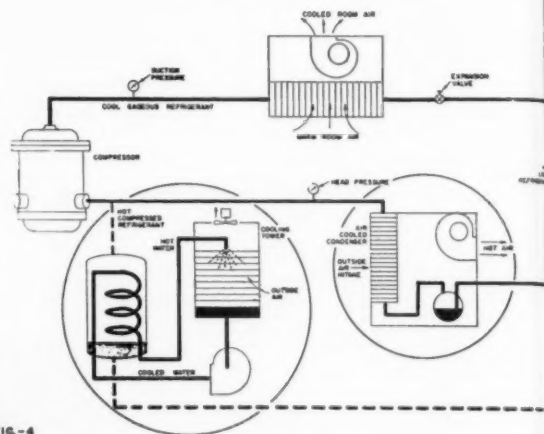


FIG.-4

Air is blown over the fins attached to the refrigerant tubes and directly removes the heat from the refrigerant gas which condenses inside the tubes.

Air replacing water cooling

No water is involved. This method has so many customer benefits including, in our experience, lower seasonal operating cost, that it is rapidly replacing the tower method. We feel it will be the standard method within a year or so and the rest of this paper is based on that assumption. (See also Figure 3).

After heat is removed from the refrigerant gas, condensing it, it is led as a liquid at 100° to 145°F. to an expansion valve, where it is dropped in pressure to the low side pressure, partially flashing into gas as it does so. The mixture of liquid and gas then passes through the tubes of the cooling coil gradually evaporating completely into gas as it absorbs heat from the house air stream which is blown by the furnace blower past the outer surfaces of the coil. The 40-50°F. gas then returns to the compressor to complete the cycle.

Conditions affecting compressor

The pressures at the inlet and discharge of the compressor are determined within rather narrow limits by the comfort conditions maintained inside the house and by the weather outside. If the temperature of the air in the house and passing over the cooling coil is 76°F and 50% relative humidity, a typical condition, the suction temperature will be around 40°-50°F.

Similarly outside temperature determines discharge pressure. The other

3 HP STANDARD OPEN MOTOR SINGLE PHASE. 230 VOLT CAP. START. RUN

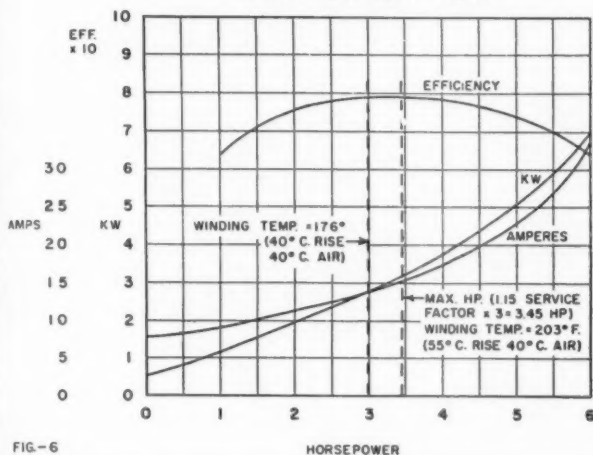


FIG-6

3 HP HERMETIC COMPRESSOR MOTOR SINGLE PHASE. 230 VOLT CAP. START. RUN

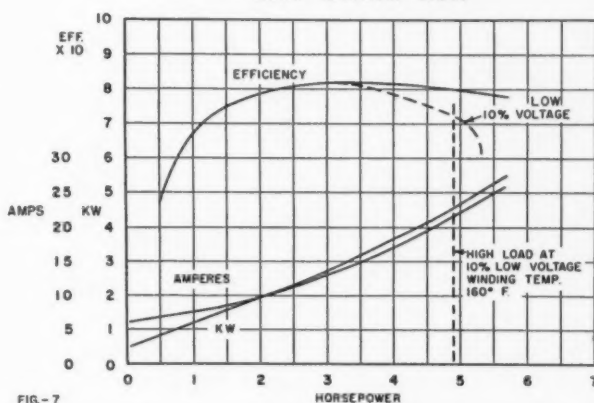


FIG-7

factor besides the suction and discharge pressures which determines the horsepower required to drive the compressor is its displacement — the volume of gas pumped.

This value is directly determined by the cooling capacity of the air conditioner — more cooling, more displacement, more horsepower. This is not a game that can be beat by design tricks. Our customers and the cooling they need for their homes determines what horsepower will be required for the air conditioning compressor.

Results of standardization

In the design of the standard type open motor, NEMA standards previously mentioned have been very important. By standardizing general purpose motors they have made available the advantages of very high production to the customer using only a few motors at a time. This standardization has resulted in the widespread acceptance of certain performance values associated with motors of a given horsepower.

Figure 5 shows starting current, full load current, maximum usable horsepower for standard 2, 3, and 5 hp, single phase motors. These values appear in many local and national codes and are used for selecting wire sizes, starting equipment, etc.

Performance of 3 hp motor

Figure 6 shows the performance curves for a 3 hp, single phase, general purpose open motor. Air is the cooling medium. The winding temperature at rated horsepower (176° in 104°F. air) is defined by the standard. The maximum horse power is limited to about

1.15 times the rated horsepower by the standard and by the fact that winding temperatures rise too high for good life beyond this load. The performance of one make open type motor built to the NEMA standard is very like that of another. The maximum usable horsepower of a 3 hp, 1 phase motor is about 3.45 hp.

Reasons for differential

Winding temperature is *not* a limiting factor for a motor used in a hermetic refrigerant system where the cool returning gas flows over the windings. If a rotor and stator similar to those used in a standard open motor are inserted in a hermetic compressor, they can be loaded almost to the breakdown point without high winding temperatures.

Figure 7 shows typical performance curves for 3 hp single phase hermetic motor. Note that what would be called a 3 hp open motor can in a compressor easily carry 4.9 hp.

The table in Figure 8 compares certain performance characteristics of a 3 hp open with a hermetic motor. Differences in service factor, maximum horsepower, name plate current and starting current are obvious. Is there any doubt that the term "3 horsepower motor" is useless as a measurement of compressor power consumption or cooling capacity? This fact has been readily recognized by many electrical engineers familiar with our business.

CONCLUSION IN DECEMBER

USEABLE HORSEPOWER FOR 2, 3, 5 HORSEPOWER MOTORS

NOMINAL H.P.	SERVICE FACTOR	MAXIMUM H.P.	NAMEPLATE AMPERES	STARTING CURRENT
2	1.2	2.4	12	50
3	1.15	3.45	17	70
5	1.15	5.75	26	100

FIG-5

Source: NEMA MG-1-4.15
NEC Table 22

COMPARISON OF 3HP OPEN AND 3HP HERMETIC MOTORS

NOMINAL H.P.	SERVICE FACTOR	MAXIMUM H.P.	NAMEPLATE AMPERES	STARTING CURRENT	STARTING CURRENT ÷ RUNNING CURRENT
3 (Standard)	1.15	3.45	17	70	4.1
3 (Hermetic)	1.63	4.9	20.8	72	3.5

FIG-8



DIES Require time and skill to build

Are your plans in such shape that you are ready to start production?

Have you made samples from new dies and had these samples enameled?

VITREO

We should like to help develop and perfect any of your new porcelain enameled parts. Now is the time to do it. Then you and we will be ready for full production.

Our design and die shop experience are at your disposal. Tell us what you have in mind for the future.

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Vacuum manufacturers gather at Homestead



A 100 YEARS OF MAKIN' AND SELLIN' is represented in the above picture. The honorary members shown above, piled up 97 years of service in the industry before their retirement. Left to right are J. H. Nuffer, long head of Airway Appliance Corp. (and former VCMA president); R. J. Simmons, VCMA president for 11 years, and longtime veep for Birtman Electric Co.; and Thomas F. Kelly, veteran Hoover Co. representative.

Group honors R. J. Simmons with "This is Your Life" presentation." President Mansager reports on increase in sales.

WOMEN's buying of vacuum cleaners has passed a grand total of more than 54 million units since the founding of the industry, or the equivalent of 1.2 cleaners to every home now electrified, Oscar M. Mansager, executive vice-president of the Hoover Co., North Canton, Ohio, declared at The Homestead, Hot Springs, Va., at the fall meeting (Sept. 20) of the Vacuum Cleaner Manufacturers' Assn., of which he is president.

finish NOVEMBER • 1956

"Of these, our industry has sold more than 31 million in the few years since World War II, compared to our production of about 23.5 million in the entire period of thirty-three years preceding that event," Mr. Mansager asserted. He added that factory sales in the first eight months of this year were greatest in the industry's history for that period, and also exceeded any full year preceding World War II.

"Inasmuch as each of our member companies has its own particular methods for bringing about women's decisions in favor of its products, it should be obvious that we all are engaged in a business constantly challenging our competitive ingenuity," he declared.

The "immense residential building boom" and the fact that American girls are marrying and setting up their own households at a younger age than ever before and that there is less and less "mother-and-daughter" use of the vacuum cleaner, were given by President Mansager as prime reasons for the industry's record business.

Starting as "the graduation exercises of Warm Springs Valley School District No. 1," a children's party at the fall meeting of the Vacuum Cleaner Manufacturers' Association at The Homestead, Hot Springs, Va., quickly turned into a "This Is Your Life" enactment honoring Richard J. Simmons.

Throughout extended service for VCMA, Simmons held a great many posts and chairmanships, including long activity on the executive committee, and he ran up a record-breaking period of

VCMA PRESIDENT Oscar Mansager, shown with his wife above, during festivities at annual meet, told the group earlier of the upsurge in vacuum cleaner sales, with 1956 sales making new records.





**Binks Model 18VSS
spray gun**

Built for steady production work. Drop forged aluminum body—tough black electrolytic finish. Gun head, nozzle, fluid needle valve—all parts in contact with the fluid—are stainless steel. Cartridge type air valve.



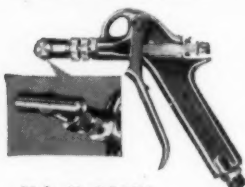
**Binks Model 19V
spray gun**

Lightweight production gun. One piece aluminum body, heavily plated. Head insert is drop forged bronze. Bronze air nozzle. Cartridge type air valve.



Binks Model 21V spray gun

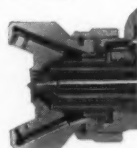
Pneumatically operated automatic gun for production line work. Up to 250 operations a minute. Will not spit or drip. Drop forged bronze body and air nozzle, heavily plated.



**Binks Model 31V
flow gun**

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**Binks
67PD
nozzle**



Spray full production shift without fogging or plugging. Reduction in number of air orifices, rearrangement of locations and increased diameters provide excellent atomization at air pressures as low as 30 lbs. Delivers more material to product...gives better coverage with fewer passes.

the RIGHT spray gun can step up your production

How? By stepping up production and improving quality.

Binks spray guns and nozzles permit one pass coverage of uniform film thickness.

How? By lengthening gun life.

Tungsten carbide inserts in material nozzles and needle valves prevent excessive wear.

How? By preventing gun metal contamination of sprayed fluids.

Stainless steel parts in the Model

18VSS (and in Model 18RVSS, the mechanically operated automatic version of the same gun) prevent gun metal contamination of sprayed fluids.

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VACUUM MAKERS CONTINUED

eleven years as its president, from 1935 through 1945.

Simmons' success as chairman of the committee planning VCMA's annual fall outing for members and their wives at The Homestead also led to his being made lifetime chairman of the Hot Springs committee, but his carefully laid plans for the 1956 fall gathering proved to have a closely guarded surprise interlude, kept secret from him until midway of the children's program, with VCMA's members all clad in the costumes of the 6-10-year-old set.

In narration by John A. Kemper, vice-president, the Scott & Fetzer Co., Cleveland, vice-chairman of the Hot Springs committee, and with screen slides made from photographs obtained in Simmons' boyhood town of Greenfield, Ill., and high school and college pictures from the collection of a life-long friend, Waldo Abbot, director of broadcasting, WUOM, Ann Arbor, and WFUM, Flint, Mich., the VCMA members were given a quick highlighting of his early days, including incidents and scenes which the subject himself confessed he had forgotten.

With the Birtman Electric Co., Chicago, for thirty-three years, he was an officer of that concern more than thirty years, finally as vice-president, a post he held when he retired from the company a few months ago.



"RALPH EDWARDS—VCMA STYLE"
was John A. Kemper, shown above with his wife, who presided at the "This is Your Life" tribute to Richard J. Simmons at the meet. Kemper is vice president, Scott & Fetzer Co.

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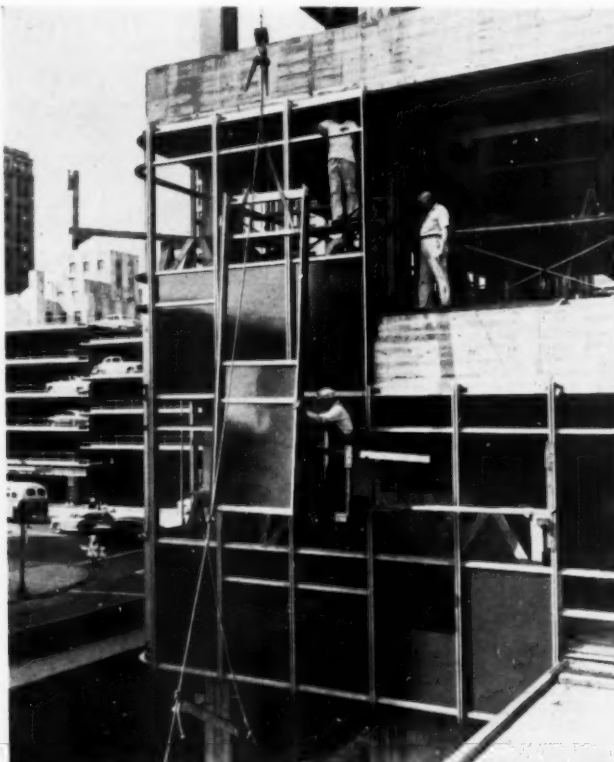


Lutheran Brotherhood puts "new look" in Twiity

porcelain enameled steel panels create blue-green curtain wall of bea housing advanced thinking in design, structure, and mechanical equipment



PRE-ASSEMBLED PANELS are moved from delivery trucks to the staging areas on four-wheel dollies where guide ropes are attached.



CAREFUL HANDLING OF THE PORCELAIN ENAMELED steel panels called for one man on guide rope to keep panel away from building as panel was raised by block and fall.



SEALING PAINT is accomplished in to man has applied

by *C. R. Sample* • MANAGING EDITOR



THAT BRIGHT NEW LOOK on the skyline of Minneapolis, Minn., is the new home office building of the Lutheran Brotherhood, fraternal life insurance and benevolent organization. It embodies advanced thinking in architectural design, structure, and mechanical equipment, and in community and employee facilities.

Ground breaking for the new structure was Nov. 24, 1954 with occupancy on Feb. 24, 1956. Total cost of the structure is \$2,500,000. The building includes the main unit, six stories above street level, plus court level and sub-basement, and the local services wing, which includes the ground floor and court level, and sub-basement. Overall dimensions are 205' long, 63' wide;

with the wing 92' wide and 64' long. Outstanding features include the cantilever construction with the exterior curtain wall of blue-green porcelain enameled steel and double pane insulating plate glass, providing uninterrupted window area around the perimeter of the building.

The reinforced concrete structure is completely masked by the polished curtain walls of insulating glass and glass-insulated porcelain enamel steel panels. The curtain wall skin of blue-green panels and tinted heat-absorbing glass completely envelops the five upper stories of the main office building.

The continuous windows are interrupted by columns around the perimeter of the building as the curtain-wall skin

NOVEMBER • 1956 finish

city skyline

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lished on to flash joint. Flashshield is in-
applied and, above, sealed with waterproof.

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ARCHITECTURAL RECORD

is cantilevered five feet out from the supporting reinforced concrete structure at each floor.

In contrast, a low wing housing the local branch office is sheathed in New England granite in a mixture of rust-color rough surfacing.

The horizontal bands of windows and blue-green spandrels are broken only by narrow "snap-on" mullions of stainless steel. These snap-on cover mouldings eliminate the need for screws and/or other fasteners. The result is a completely clean line, a detail which en-

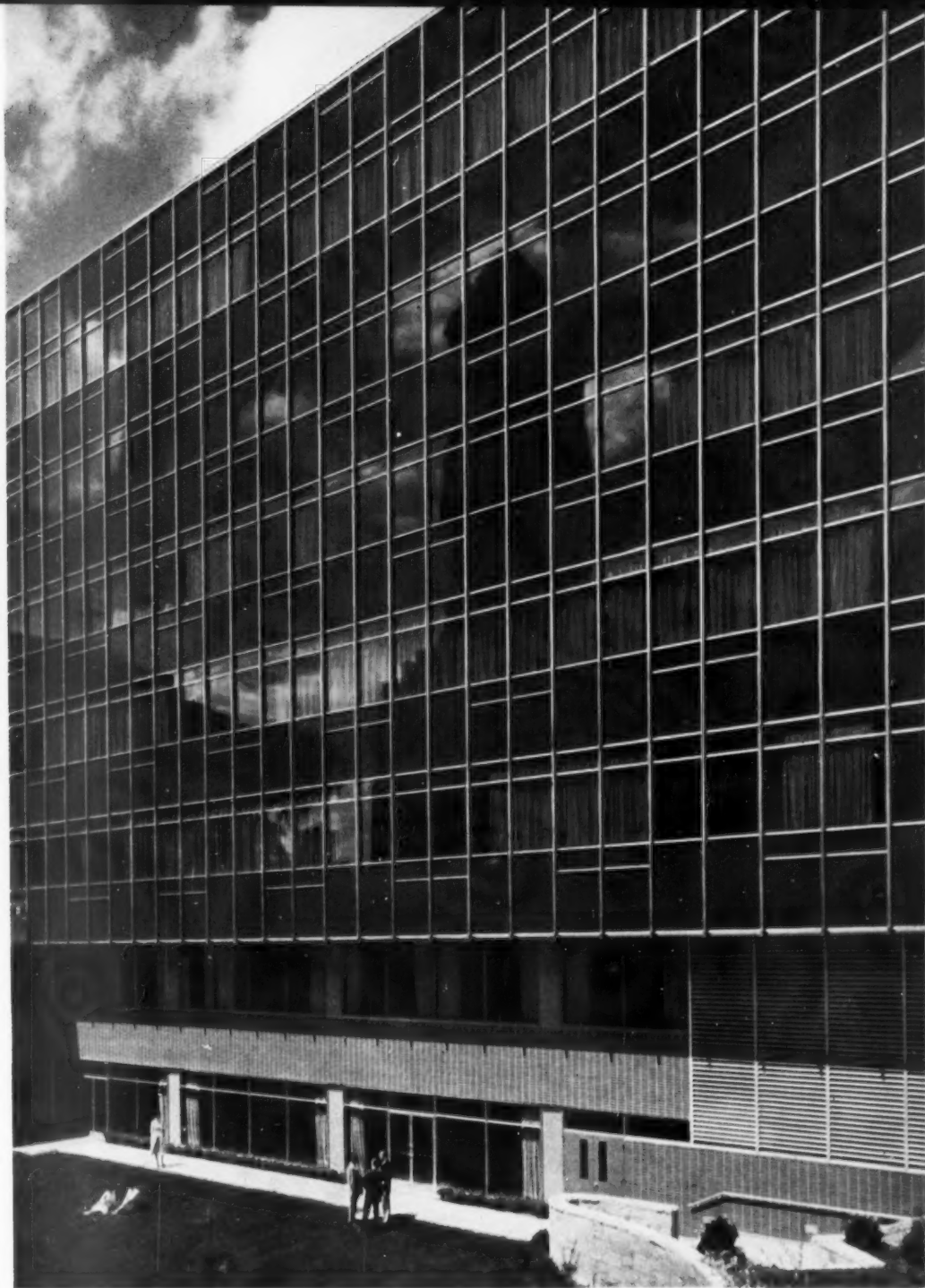
hances the overall appearance of the building through its design simplicity.

Suggestive of the religious affiliation of the fraternal organization are the crosses formed on the exterior of the building by the intersection of several horizontal stainless steel members with the mullions. These mullions, stops, and the other curtain wall components have been designed to "breathe," eliminat-

ing the possibility of condensation, while at the same time are tight-fitting expandable components which allow no filtration of moisture into the structure.

The main entrance of the building is set back from the street and is sheltered by the overhanging general office wing above. Supporting columns are encased in stainless steel. The Lutheran Brotherhood name, put there to "ever

SYMBOLIC ARCHITECTURAL DESIGN is revealed in this photo of the structure, viewing into the sunken garden. The unusual breathing curtain wall of 640 windows and 768 porcelain enamel panels is interrupted only by the 4" stainless steel mullions and rails that form a cross pattern, reflecting religious origin of the society.





LUTHERAN CONTINUED

last," appears in stainless steel letters on the granite wall of the ground level concave, and again on the main side of the building. Radiant heating coils are buried in the sidewalk at the two street's intersection, keeping the entrance free from snow and ice. The spacious lobby has full length glass windows on two sides, and tempered glass doors with concealed closers, all set in modular aluminum frames. In the lobby, polished Italian Laredo Chiaro marble is used to accentuate the stainless steel doors of the elevators.

The completely modern year-round "inside weather" system includes one of the first completely modern air conditioning, temperature, and humidity-controlled air filtration systems incorporated into the original design of a Twin City office building. Year 'round air conditioning is provided in separate interior and perimeter systems, sup-

plied from the sub-basement. A high-pressure conduit system counteracts summer heat or winter cold in fanless units located around the the perimeter of the building. Each private office occupant can modify the air supply to suit his taste. Humidity control is provided by a "reheat system." Air is chilled by well water and compressors in the basement where, with excess moisture removed, the air is warmed to comfort conditions by steam coils located on each floor. Outside air is drawn into the building through a 24-by-16 foot intake in the garden wall. It is cleaned by the latest electrostatic air filters, and by a unique roll type glass fiber filter that changes automatically whenever accumulated dirt impedes the flow of air. The air conditioning units are similarly controlled, with the basement and central zones of the building being served by cold well water—chilled water from the centrifugal compressors.

EXPANDED VIEW of the new Lutheran building showing depressed garden and aluminum air conditioning louvers at lower right. Maintenance men wash

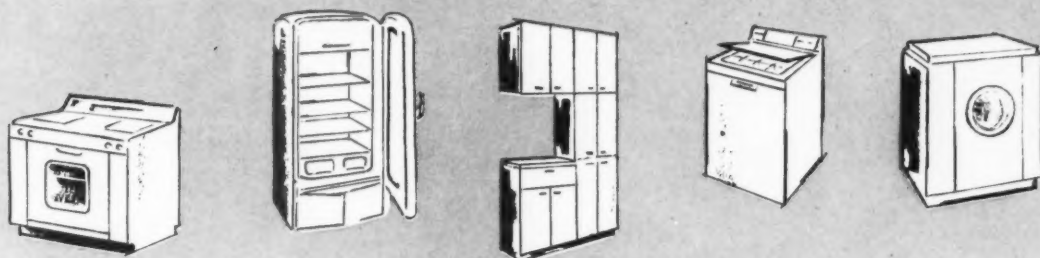


windows and enameled steel spandrels from electric powered elevator scaffold shown in mid-left of main photo.



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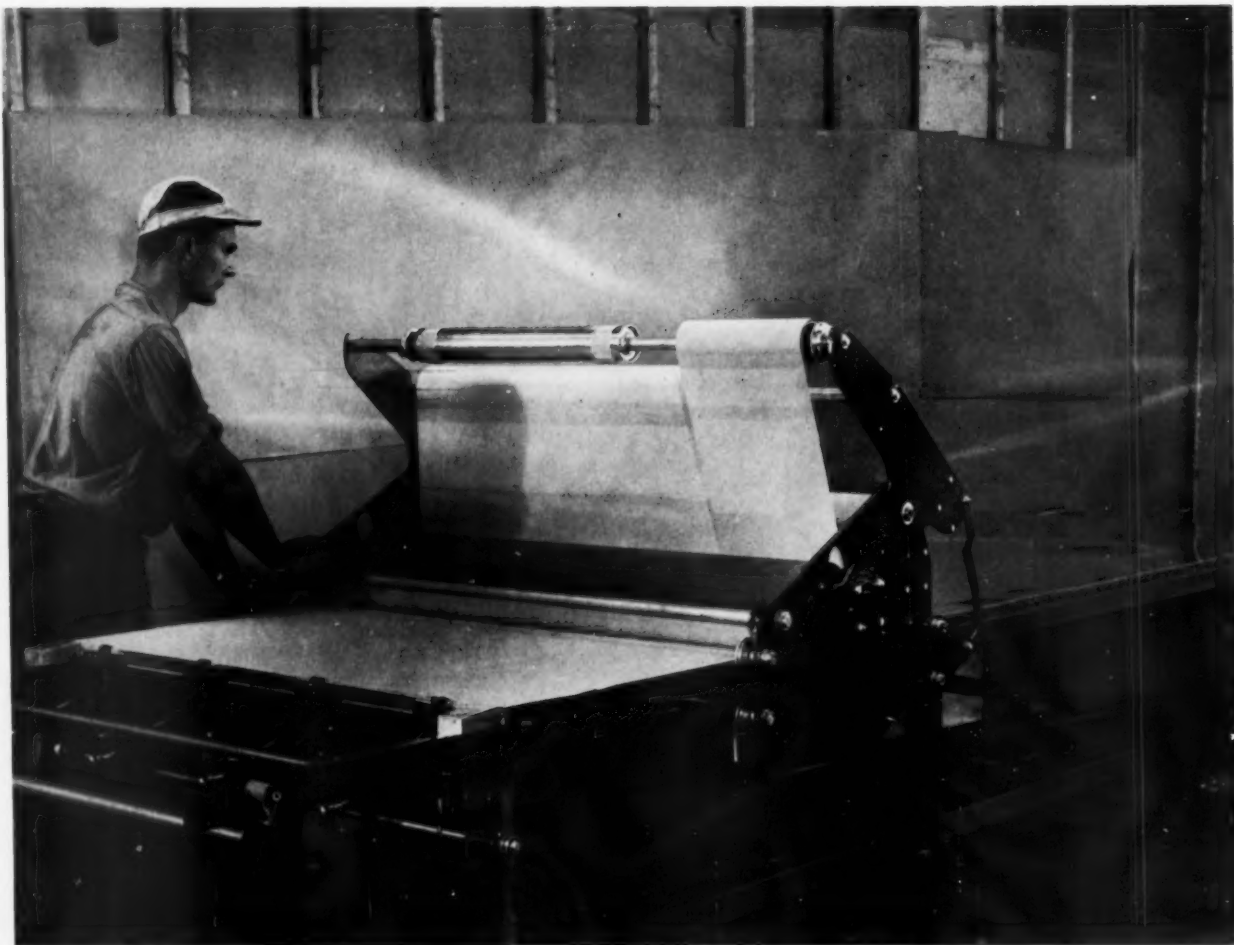
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NEED MORE INFORMATION

Source of the information on this page as well as additional details may be obtained by writing to the SPECIAL PROJECTS EDITOR of *finish*.

Mechanize surface protecting tape application



The first commercial machine designed for mechanical application of pressure sensitive tape to protect polished metal sheets has been announced. The new machine reduces time required to cover 12 foot metal sheets to one minute per side.

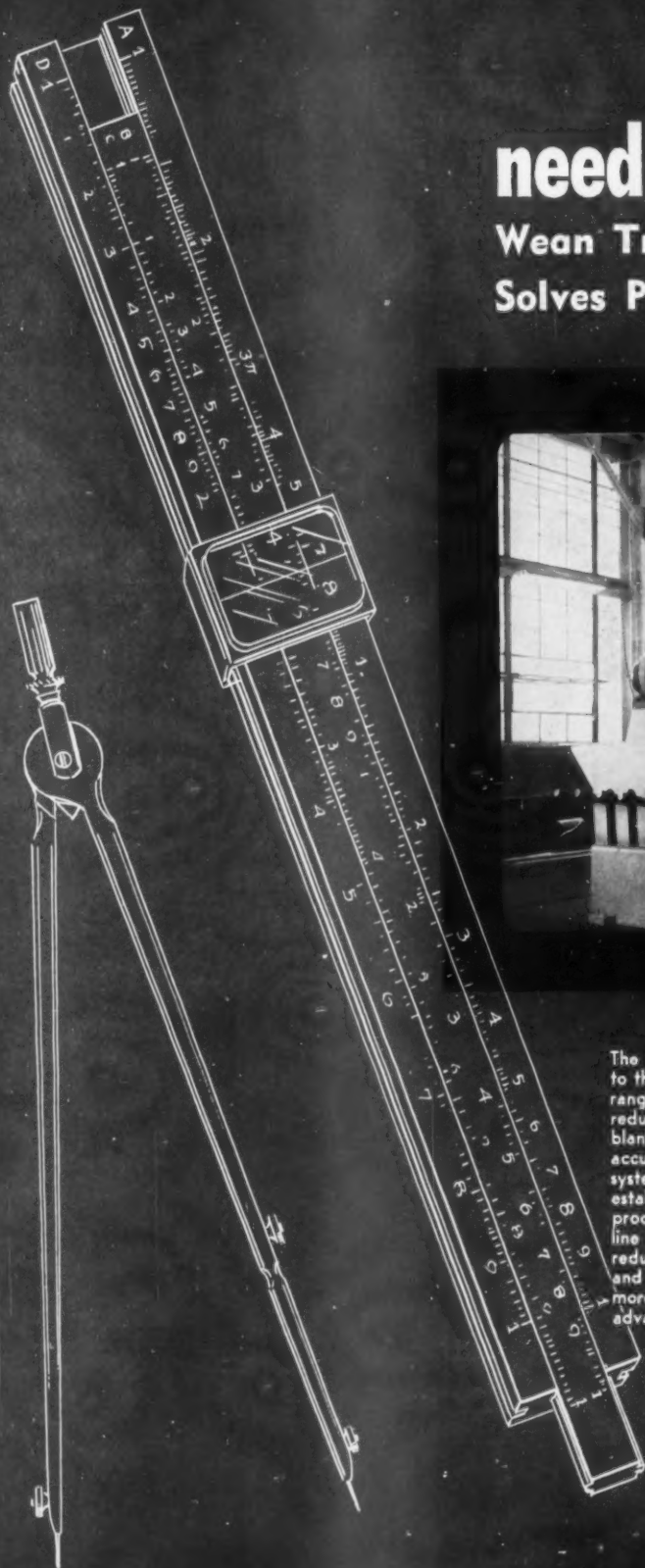
Development of the machine began in 1953 after metal fabricators began requesting a machine to speed output of covered metal sheets. Application of tape, up to that time, had to be done

by hand, raising the cost considerably.

The new machine consists of two basic units, an applicator carriage which carries, unrolls, applies and cuts the tape, and an applicator table. Two models are presently available. One applies protective tape in multiple widths up to four feet. The other applies tape in widths up to five feet. Both models have 12 foot applicator tables.

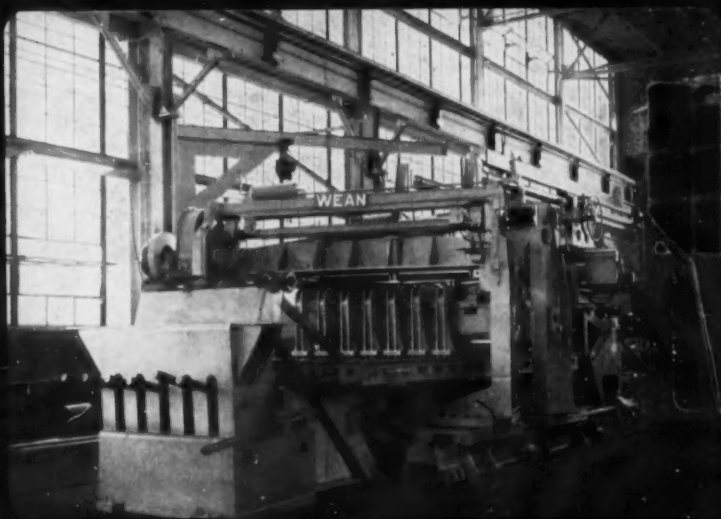
Floor space needed for the machine is approximately 16 feet by four or five

feet, depending on the model. While the table is only 12 feet long, rails carrying the applicator carriage project two feet beyond both table ends. The table, mounted on wheels, can be moved to any location. Floor clamps attached to the wheel mounts are lowered to prevent the table from moving during use. One man can operate the machine with an additional worker to assist in handling and stacking unwieldy metal sheets.

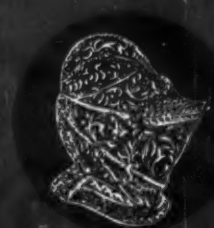


need an idea?

**Wean Trapezoidal Shear Line
Solves Problem for Auto Maker**



The Wean Trapezoidal Shear Line was developed as an answer to the high speed blanking of irregularly shaped pieces in the broad range that can be described as trapezoids or parallelograms. This use reduces tremendously the cost of expensive die setup in major blanking presses. Two pieces are made at each index with the accuracy that can only be achieved by a measured length indexing system. The cut can range from 45° to 90° angles. The latter setting establishes the line as a straight cut-up unit with twice the normal production of conventional shear lines. At Wean, we consider this line as another important step forward in our policy of cost reduction through progressive engineering. People in the automotive and metal fabricating fields have come to look more and more toward Wean Equipment for spectacular advances in machinery for metal processing.



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Formability of metals

basic characteristics of metals, materials for cold forming, and divisions of cold forming methods are analysed in this four part special report by Spencer

by *Lester F. Spencer* • CONSULTANT IN METALLURGY

THE low carbon steels, containing usually less than 0.20% carbon, are frequently employed in cold forming operations; the specific type, quality and temper is selected in accordance to both the forming operation involved and the severity of the deformation. For normal and moderately severe forming operations, rimmed steel is usually satisfactory; however, as the severity of the deformation increases, both alloy residuals and carbon contents are controlled to minimum specified limits.

Where severe drawing operations are required, or, where a non-aging mate-

rial can be used to advantage, the aluminum killed steels are very recommended. This type of material has one disadvantage in that the surface condition is not guaranteed, i.e., surface defects may occur which render this material unsuitable for parts which necessarily must have either a plated or painted finish. To eliminate this disadvantage, the vanadium killed steels have been introduced; these steels are reputed to have a formability equivalent to the aluminum killed steels and also a surface finish which is far superior. Semi-killed steels are characterized by

variable degrees of uniformity of composition and have properties between those of killed and rimmed steels.

Types of steel available

The types of steels above are available for both sheet and strip. In addition, hot rolled and pickled or cold rolled finishes can be obtained. Cold rolled strip can also be designated in accordance to temper, edge and finish, the specific choice being dependent upon the degree of forming and the end use of the material.

In addition, commercial, drawing or physical quality sheet material is available in both the hot rolled annealed and the cold finished conditions. Let us consider the differential between these grades on cold finished material.

Thus commercial quality sheet is suitable for applications which require a fairly good surface. The dull texture obtained is suitable for the application of paints, enamels or lacquers, but not suitable for electroplating. This grade of material has bend requirements; the values of which will vary with the carbon content of the material. Drawing quality sheets are for applications where deformations are too severe for commercial quality, the surface before and after drawing being of prime importance.

These sheets are suitable for the application of various organic finishes, but not suitable for electroplating where surface uniformity is of importance. Physical quality sheets, as the name implies, are specified where mechanical properties are specified.

Where stock suitable for plating is required, cold rolled carbon steel strip having a No. 3 or best bright finish is usually employed. However, suitable protection of the material must be given during press working so that the finish is maintained during working. The No. 1 finish as obtained in cold rolled strip is suitable for the application of organic finishes, and the dull finish will aid considerably in drawing operations. This finish is not suitable for subsequent

Photo Courtesy Reynolds Aluminum Co.



FIGURE FOUR: an operation involving shear — large mechanical press used for blanking and forming an aluminum alloy of considerable thickness.

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have served the needs of industry
for nearly a quarter century

Just recently we had occasion to take a look back over our shoulders at the years that have passed since we first started serving the needs of industry with heat resisting castings. It hardly seems possible, but nearly a quarter of a century has passed since we first opened our doors. We've made a lot of friends in that time and have gained great satisfaction from knowing that we've been able to solve a lot of stubborn problems for them. With high temperature playing an ever increasing role in our expanding industry, we find ourselves called upon more and more to solve the problems that high temperature service conditions impose. We're gratified at the confidence that the name FAHRALLOY has come to mean, and we hope that as the occasion arises you'll call on us and learn from your own personal experience that whenever the problem is heat the solution is FAHRALLOY.



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Table 1 Chemical compositions of the more popular grades of stainless steels.

Type	Chemical Composition, Per Cent				Comments	
	Carbon	Chromium	Nickel	Others		
Austenitic Types	301	0.08/0.20	16.0/18.0	6.0/8.0	—	Moderate deep drawing, bending, forming, blanking.
	302	0.08/0.20	17.0/19.0	8.0/10.0	—	Deep drawing, bending, forming, upsetting, blanking, coining.
	304	0.08 Max.	18.0/20.0	8.0/11.0	—	Same as type 302.
	305	0.08 Max.	17.0/19.0	10.0/13.0	—	Blanking, forming, deep drawing, heading and spinning.
	308	0.08 Max.	19.0/21.0	10.0/12.0	—	Limited drawing, stamping, forming, bending, blanking.
	309	0.20 Max.	22.0/24.0	12.0/15.0	—	
	310	0.25 Max.	24.0/26.0	19.0/22.0	—	
	316	0.10 Max.	16.0/18.0	10.0/14.0	Mo/2.0-3.0	Deep drawing, stamping, heading, upsetting, bending, blanking.
	317	0.10 Max.	18.0/20.0	11.0/14.0	Mo/3.0-4.0	
	321	0.08 Max.	17.0/19.0	8.0/11.0	Ti/5xCarbon Min.	Blanking, coining, deep drawing, forming, upsetting.
	347	0.08 Max.	17.0/19.0	9.0/12.0	Cb/10xCarbon Min.	
Martensitic Types	403	0.15 Max.	11.5/13.0	—	—	Turbine quality.
	410	0.15 Max.	11.5/13.5	—	—	Blanking, shallow drawing, cold heading, forming.
	414	0.15 Max.	11.5/13.5	1.25/2.5	—	Blanking, shallow forming.
	420	Over 0.20	12.0/14.0	—	—	Shallow forming, blanking, limited heading and upsetting.
	440A	0.60/0.75	16.0/18.0	—	Mo/0.75 Max.	Blanking, limited forming, heading and upsetting. Difficulty increasing with carbon content.
	440B	0.75/0.95	16.0/18.0	—	Mo/0.75 Max.	
	440C	0.95/1.20	16.0/18.0	—	Mo/0.75 Max.	
Ferritic Types	430	0.12 Max.	14.0/18.0	—	—	Blanking, forming, deep drawing, upsetting, roll forming.
	442	0.20 Max.	18.0/23.0	—	—	Blanking, forming, stamping, limited drawing.

Note: The comments are but an indication of the typical operations which can be performed. The ease of forming and the need for intermediate annealing will vary with the work hardening characteristics of the material. Knowledge of these characteristics along with both experience and experimentation is required to establish a sequence of operations.

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FORMABILITY CONTINUED

plating. The No. 2 or regular bright finish is also not applicable to plating unless the standard finishing operations precede actual plating.

The stainless steels

The corrosion and heat resistance of these materials are well known, these properties accounting for their wide usage in consumer goods. As is indicated in Table 1, a variety of compositions are available; each composition has specific limits as to formability, usage, etc. However, since a full discussion of these grades cannot be made within the scope of this article, the following are generalized statements.

The types of stainless steels can be classified into 3 general groupings. Group one, the martensitic or hardenable grades of stainless, contains chromium as the major alloying element. These grades can all be moderately formed; type 410 is employed for shallow drawing. However, their main purpose is to obtain both hardenability and high strengths through the medium of a standard heat and quench procedure. Corrosion resistance is at a maximum when heat treated.

Group two, the ferritic stainless steels, also has chromium as the major alloying element. However, the balance of chromium and carbon is such that these grades are considered as non-hardening.

Full corrosion resistance is obtained in the annealed condition. Due to the shortage of nickel and the subsequent government controls on the austenitic steels, type 430, within this class, is becoming increasingly popular for deep drawing applications. The ductility of this composition in the annealed state approaches that exhibited by mild deep drawing steel; however, it is not as favorable as the austenitic grades.

The austenitic stainless

The third and most widely used group for press working is the austenitic stainless. Type 302 is used to a large extent in press drawing, reductions as high as 50% being realized before intermediate annealing is required. Type 301 has a higher rate of work hardening than type 302 and less reductions are permissible, especially on redraw operations. Thus, stress cracking may occur with this composition at relative low reductions on redraw operations. Type 304 reacts very similarly to type 302. Type 305 has the least work hardening characteristics within the group, and consequently, has been used quite successfully in both deep drawing and spinning operations.

Data on other 300 series alloys

The austenitic alloys 308, 309 and 310 are quite difficult to fabricate, however, since these alloys are usually used for high temperature service, forming operations are usually at a minimum. The stabilized grades types 347 and 321 have less favorable forming characteristics than that displayed by types 302, 304 and 305; however, they are invaluable for applications requiring fusion welding. Stainless types 316 and 317 have superior corrosion resisting properties and have forming characteristics very similar to the stabilized grades. However, they have been successfully formed in operations requiring severe deformations.

Equipment and finish

Due to the higher strengths of the stainless steels, more powerful equipment is required and greater care in tooling must be observed as compared to similar forming operations involving mild steel. In addition, the choice of surface finish on incoming material is of importance, depending upon the end use of the material. Thus, a dull finish is usually recommended for drawing purposes, while the brighter, polished finishes are desired where subsequent buffing operations on the completed piece is to be done. In the latter in-

stance, the protection of the luster bright sheet during press working is essential.

Utilization of various tempers

As in mild steel, various tempers with in the austenitic alloys can also be used in applications requiring extreme stiffness in the finished part. The various tempers available are indicated in Table 2, the formability of the material decreasing as the hardness increases. The higher hardnesses are frequently used in spring applications.

The copper base alloys

Copper and those alloys identified as the brasses, which contain zinc as the alloying element, exhibit excellent cold working properties. These alloys are able to withstand severe deformation before a re-crystallization anneal is required. Within the brass compositions, which are tabulated, the increase in the zinc content will realize increasing strength properties within the alloy. The best ductility and strength combination is at approximately 30 to 35% zinc. As is the case with other materials, these copper alloys are produced in a variety of cold worked tempers from soft to extra spring. The workability decreases as the hardness of the material increases. With the annealed temper, these materials are synonymous in ease in working, minimum tool wear, minimum breakage, ease in plating and finishing.

The stronger copper base alloys

The stronger copper base alloys containing tin (the phosphor bronzes), silicon (the silicon bronzes), nickel (the cupro nickels), and both nickel and zinc (the nickel silvers) can be press worked with success. However, their formability is not as good as that exhibited by the brasses and copper. The rate of cold work hardening is greater. The specific degree depends upon the specific alloy type. This requires the use of more frequent intermediate anneals between the forming and drawing operations.

The phosphor bronzes are used in applications where maximum strength and fatigue resistance are required; the silicon bronzes, grade B, are used quite frequently in cold heading; and the nickel silvers are used quite extensively in hollow ware applications. These alloys have limited forming ability when obtained in the proper temper for spring applications. The alloy known as beryllium copper is formed prior to hardening if the forming is severe. However, it is desirable, if possible, to work with

finish NOVEMBER • 1956

Table 2 Hardness Ranges of Various Tempers of Three Stainless Compositions

Temper Designation	Approximate Rockwell Hardness Range		
	Type 301	Type 302	Type 430
Dead Soft	B75 to B80	B75 to B80	B75 to B80
Soft	B80 to B85	B80 to B85	B80 to B85
One-Quarter Hard	B100 to C25	B100 to C25	B90 to B100
One-Half Hard	C25 to C35	C25 to C35	C15
Three-Quarters Hard	C35 to C40	C35 to C40	C20
Hard	C40 and Over	C40 and Over	C25

Table 3 Chemical Composition of the Non Ferrous Alloys used in Cold Forming

Alloy Type	Chemical Compositions, Percent										Others
	Cu	Si	Zn	Ni	Mg	Mn	Sn	Cr	Al		
The Aluminum Alloys											
2S									99.9		
3S						1.20			rem.		
52S					2.50			0.25	rem.		
17S	4.0				0.50	0.50			rem.		
24S	4.5				1.50	0.60			rem.		
53S		0.7			1.30			0.25	rem.		
61S	0.25	0.6			1.00			0.25	rem.		
The Copper Alloys											
High Brass	66.00		34.0								
Cartridge Brass	70.00		30.0								
Low Brass	80.00		20.0								
Red Brass	85.00		15.0								
Commercial Bronze	90.00		10.0								
Gilding Metal	95.00		5.0								
Elec. Tough Pitch Copper	99.92									Oxygen—0.04	
Phosphor Bronze, Grade C	91.90						8.0			Phosphorous—0.10	
Phosphor Bronze, Grade A	94.35						5.5			Phosphorous—0.15	
Silicon Bronze, Grade A	96.00	3.0				1.0					
Silicon Bronze, Grade B	98.00	1.5				0.25					
Nickel Silver (A)	65.00		17.0	18.0							
Nickel Silver (B)	55.00		27.0	18.0							
Nickel Silver, 10—	66.00		24.0	10.0							
Cupro Nickel	70.00		30.0								
Magnesium Alloys											
AZ31			1.0		rem.				3.0		
AZ51			1.0		rem.				5.0		
M1					rem.	1.50					
The Zinc Alloys											
			rem.							Lead—0.08	
			rem.							Lead, Cadmium—0.06	
	1.0		rem.		0.01					Lead, Cadmium—0.03	
	1.0		rem.								
The High Nickel Alloys											
Monel	30.0	0.10		67.0		1.0				Iron—1.40	
Nickel	0.1	0.05		99.4		0.2				Iron—0.15	
Inconel	0.2	0.25		78.5		0.25		14.0		Iron—6.5	
K Monel	29.0	0.50		66.0		0.85			2.75	Iron—0.9	

metal that has been partially hardened by cold working, since this will improve the spring characteristics of the metal after final heat treatment.

The aluminum base alloys

The aluminum base alloys are among the easiest of metals to form into complex shapes. These alloys are divided into two classifications, non-heat treating alloys and heat treatable alloys.

The non-heat treatable alloys

In the non-heat treatable class the alloy types 2S, 3S and 52S are easily

formed; several successive drawing and spinning operations are permissible before intermediate annealing is required.

A wide range of mechanical properties are available in cold worked tempers. However, the amount of press room forming that is permissible will decrease as the original hardness of the metal increases. The harder tempers, such as 1/2 hard, 3/4 hard or even full hard, can be advantageously employed on applications which require a high strength imparted by cold working, but has limited press working operations. For some drawing operations, the 1/2

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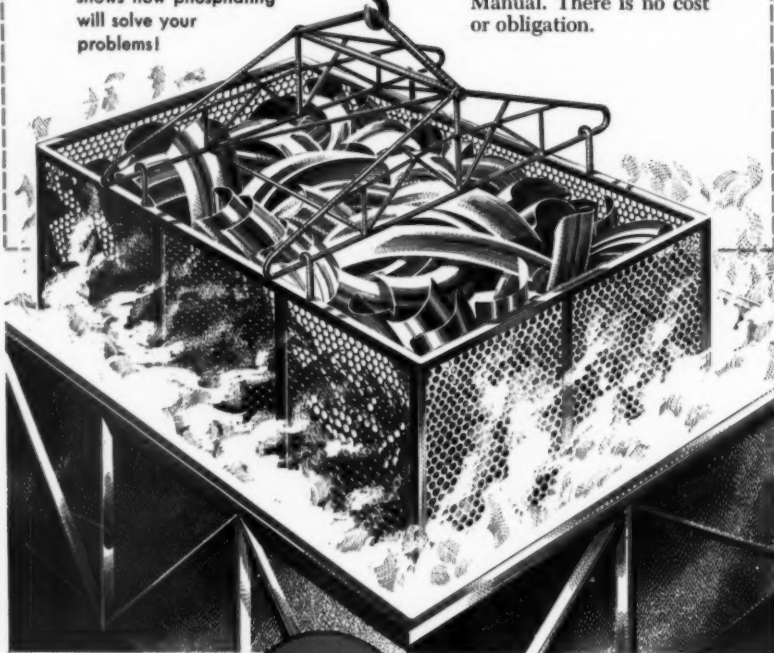


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FORMABILITY CONTINUED

hard temper retains sufficient ductility for good working properties, and even shallow drawing has been successful in the full hard temper.

The heat treatable alloys

Within this classification those such as 17S, 24S and 61S can also be readily formed; the applications involving severe deformations are produced on the annealed temper of the specific alloy type. Since these alloys obtain substantially higher mechanical properties in the heat treated condition, this operation is employed after severe deformation. However, in some instances, limited forming can be realized even when the alloy is in the solution treated stage. In this case, more liberal radii are employed in bending operations, and sizing operations can be performed before the alloy has aged.

The high nickel alloys

The ease of forming this classification of alloys, the analysis of which are tabulated, will vary with the alloy. However, complex shapes are possible, provided intermediate anneals are judiciously placed between the draws. 'A Nickel' will form very similarly to high brass, whereas alloys such as Inconel, Inconel X, Monel, Duranickel and Hastelloy form very similarly to the austenitic stainless steels.

The magnesium alloys

The magnesium alloys are formed in the warm condition, the temperature of the sheet during forming varying from 300 to 600 degrees F., depending upon the specific alloy, the type of forming and equipment. Light operations, such as are exemplified by bending, can be performed at room temperature provided more liberal radii are used.

The zinc base alloys

Little difficulty can be expected in the forming of these alloy types; however, one precautionary step is that the sheet be above 70 degrees F. The most common soft alloy type that can be formed into various shapes by spinning is pewter or Britannia metal.

IN DECEMBER **3**
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Vicary named president, — Hotpoint's Sharp reports on future developments for appliances

"Business Conditions" given thorough study at P.

JAMES W. VICARY, president of Ervite Corp., Erie, Penn., was elected president of the Porcelain Enamel Institute to serve a two-year term, at the Institute's 25th Annual Meeting held at the Broadmoor, Colorado Springs, Colo., September 18-21.

Vicary succeeds Glenn A. Hutt, vice president of Ferro Corp., Cleveland, Ohio, who was elected to the newly created officer position, chairman of the board of trustees. The gathering of executives from porcelain enameling plants and their suppliers of materials and equipment had occasion, during their meeting, to review the outstanding accomplishments within their industry that had taken place during Mr. Hutt's two-year term of office. Vicary has a background of a number of years experience in the porcelain enameling industry. He graduated from the Massachusetts Institute of Technology in 1933. After a year with the General Electric Co., he joined Dravo Co., Pittsburgh. Then he

became general manager of the Erie Enameling Co. In 1945, he organized his own firm, Ervite Corp. For the past two years he has held the chairmanship of the Institute's Architectural Division and has devoted much time, and has traveled extensively in connection with this position.

P. B. McBride, Porcelain Metals Corp., Louisville, Ky., was re-elected treasurer. John C. Oliver, Washington, D. C., was re-elected managing director and secretary of the Institute.

Outstanding speakers on program

Appliances, signs, sales techniques, and general business conditions were some of the topics aired at the 25th Annual Meeting.

At the annual corporate meeting of the group held on the second day of the conference, those in attendance heard A. B. Friedmann, Chicago Vitreous Corp., and chairman of the PEI Market Development committee, present his

views on industry selling techniques. Then John D. Wilson, vice president of the Chase Manhattan Bank, presented "The Outlook for Business."

The outlook for business

Keynoting the general session on September 20 was the address of John C. Sharp, president of Hotpoint Co., who spoke on "Future Developments in Appliances." An address entitled "The Care and Feeding of Architects" was presented by James M. Hunter, prominent Colorado architect. Following Hunter on the program was T. L. Cummings, Jr., president of Cummings and Co., a Nashville, Tenn., sign firm, who spoke on "The Need for a New Sales Approach in Selling Porcelain Enamel Signs."

Business generally "will continue to operate at a very high level in 1957," Wilson predicted. "The problem of the immediate future," he said, "will continue to be one of warding off infla-



Finance Bank's Wilson predicts continuing high level of business

at P.E.I. 25th Annual Meeting

tionary pressures, as well as preventing those excesses which often develop in periods of great prosperity."

Wilson asserted that thus far we have been moderately successful in our fight against inflation. However, the period ahead promises to offer one of the most severe price tests the economy has encountered since the '51 Korean upsurge.

In analyzing recent developments, Wilson pointed out to the Institute group that the advance in over-all production and income has tended to level off since the end of last year. This levelling off process, he added, has been essential if the American economy is to operate within the limits of existing resources and capacity. However, the levelling off has been the end result of divergent movements in certain of the nation's industries. Declines in automobiles and residential building, for example, have been more than offset by increased business spending on plant and equipment, and by heavier consumer outlays for

those items other than automobiles.

Looking ahead, Wilson said that he foresees the automobile industry operating at a somewhat higher rate next year. Residential building, on the other hand, is likely to continue to be affected by tight mortgage money, with little improvement in sight. Consumers generally will have more money to spend in coming months, according to Wilson, and retail sales should run in record volume.

Predicts record in 1957

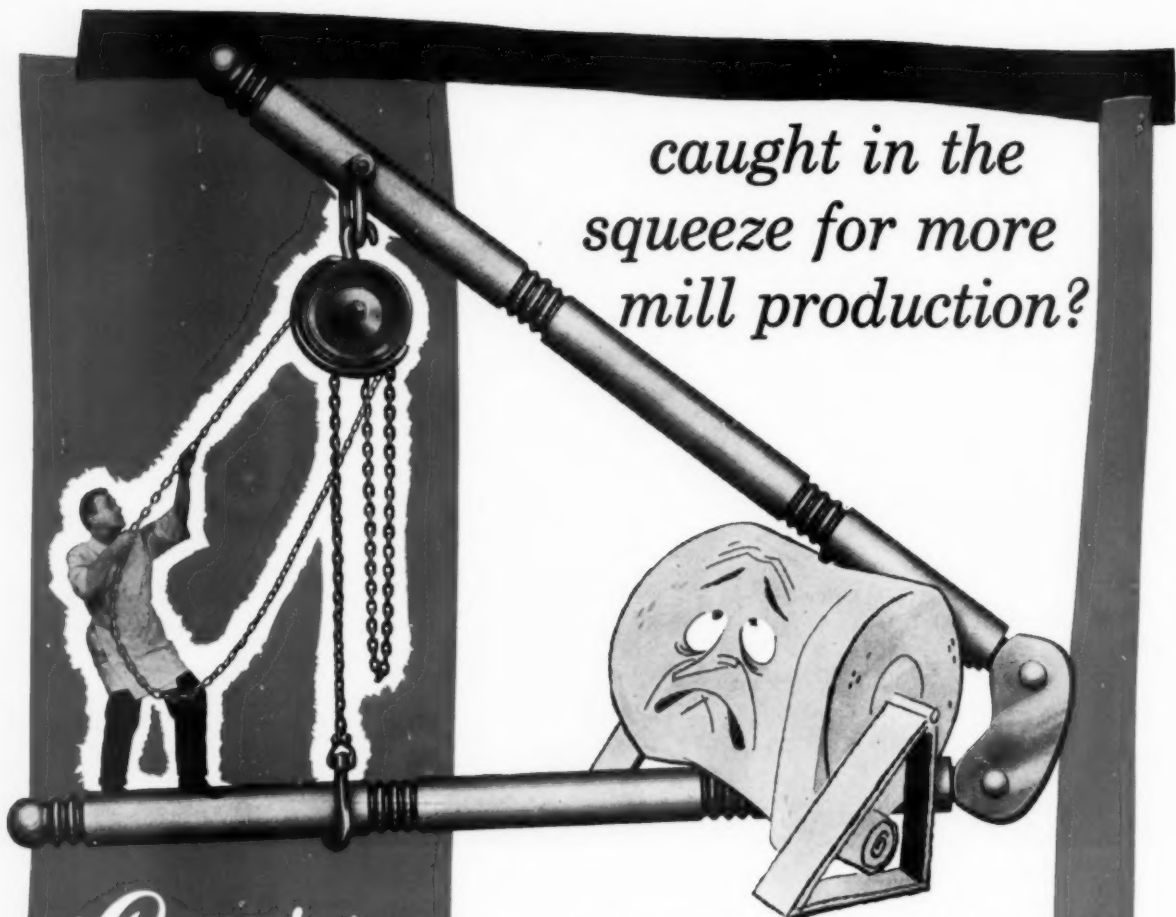
Appliances have done "pretty well" in '56. Consumer incomes and consumer sales will be the highest in history in '57, Wilson said, and appliances should get their fair share. Appliance prices changed very little until recent weeks but are now undergoing some general increase.

Government spending also is expected to be an expansionary influence in 1957, Wilson asserted, pointing to the recent

forecast by the Secretary of the Treasury that federal expenditures will increase by \$2.7 billions. In addition, state and local governments are expected to spend more on schools, roads, and other public facilities.

Wilson indicated that one of the most powerful stimuli to business generally has been the high rate of capital expenditure now being undertaken by American corporations. He issued a word of caution in this regard, however, stating that business must guard against building ahead too fast. "At present, business is adding to its plant capacity at a rate which is greater than the normal growth in the past. Many companies, in effect, are creating a certain amount of excess capacity. This is desirable and according to plan, for in many lines we have lacked adequate reserve capacity. Nevertheless, the process of creating excess capacity is not one that can continue indefinitely," he said.

The bank vice president warned the group against a tendency to think of the old-fashioned business cycle as a thing of the past. "It would be a mistake to base our business planning on such a premise," he asserted, "and not to recognize that we may indeed run into more serious setbacks than we thus



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far have encountered in the post-war period. At the same time, it would be equally shortsighted to assume that we must inevitably head toward another deep depression like that of the '30s. On the contrary, there are a number of significant differences in our economy today from that of the '30s, and if we manage our affairs with a modicum of good sense and restraint, we should be fully capable of achieving those high-level goals for 1965 and 1975 which the long-range forecasters hold out for us."

Merry-go-round selling

In his report entitled "If you want new business, get new customers," Alfred B. Friedmann, chairman, market development committee, stated that "there are only two ways to increase your business — either you can go around in a circle and take business away from a competitor by price cutting or you can move forward on a positive constructive straight line and generate new business, new markets by doing a selling job. Taking business away from a competitor may be a nice ride for a while—but—where can you go on a merry-go-round?" asked Friedmann. "You end up just where you started," he continued. "There is only one way you can really build sales stability and permanent increase and that's by making a concentrated and vigorous effort to sell somebody new." "Sure, it's the hard way," he said, "but it can be done, it has been done . . . and it will be done again."

In outlining the program of the market development committee, Friedmann said, "We're setting our targets on new markets and new products . . . products that have not heretofore been finished with porcelain enamel. That's the kind of new business we're after. For a change, let's be the ones who go out and convince some prospects that our finish is better for their products than what they are now using, instead of vice versa," he proclaimed, "and," he continued, "if you don't try to capitalize on these market development activities, you won't even be playing it straight with yourself."

Need for full cooperation

"The future of porcelain enamel as an architectural material is bright and promising, and we designers, manufacturers, and distributors should feel pretty excited about it because it's in tune with our economy, our technology, and with our culture," James M. Hunter, Colorado architect, pointed out to the

Honor Porcelain Metals' McBride at Banquet



P. B. McBRIDE, PRESIDENT OF PORCELAIN METALS CORP., Louisville, Ky., was honored during the special ceremonies at the annual meeting. McBride is shown, above, accepting a token of appreciation given, on behalf of the society, by Armco's R. A. Dadisman. PEI immediate past president Glenn Hutt of Ferro Corp. (also honored by the society) observes the event. McBride served as PEI president from 1939 to 1944 and has been treasurer since 1947.

group in his speech. Hunter said that to develop porcelain enamel effectively, efficiently, and to the full measure of its aesthetic potential requires full cooperation between those who design with it and those who manufacture it. "You in the porcelain enamel industry," he stated, "have much to contribute in terms of the color, texture, and surface adornment."

He pointed out to the Institute group that "If there is any single attribute that marks the building we do, as opposed to the building done in other eras and other cultures, it is our daring. We can do these things, we have the 'know how' to do these things, and we simply do them to the astonishment of the world and ourselves," he said.

T. L. Cummings, Jr., Cummings and Co., outlined a complete merchandising plan for selling quality display signs in competition with "price" signs.

A few of the details of the comprehensive plan he outlined included: 1) Photographing the proposed location in relation to its site and surroundings, 2)

Several artists' sketches (full color art work), 3) A six-man discussion council, 4) Prints for sales and estimating, 5) A sales brochure containing photo of building with color acetate overlay showing sign in place, 6) Formal quotation for lease or sale (based on 3-year writeoff), 7) Sale at the manufacturer's completely equipped room—not at the prospects "phone ringing" office, 8) The \$500.00 sign gets the same treatment as the \$5,000.00 sign.

New approach in selling signs

Cummings stated that, by using the complete "conference tested" plan, 49.2 per cent of all sign sketches developed by his company have been converted into sales. The speaker entered a plea for an improved "merger of interest" between sign companies and enameling companies. With improved selling, constant technical advice, and counsel, Cummings said, it will be possible to capture more of the market now being drained off by competing products.

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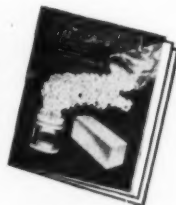
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PEI ANNUAL MEET CONTINUED

John C. Sharp, president of Hotpoint, in his speech was optimistic about business conditions in the next ten years. He told the Institute group that the appliance industry was basing its long range plans on forecasts that predict increases of \$125 billion dollars in disposable income (\$410,000,000,000 in 1960); \$161 billion dollars in gross national products (\$570,000,000,000 in '60); a 28 million population climb, and also substantial increases in average kilowatt hours in residential use. He pointed out that the appliance industry was most interested in the greater use of electricity because this meant increased use of electric appliances.

Problems facing the users of porcelain enamel, he said, include the steel supply (enameling iron) and color on free standing appliances.

"The porcelain enamel industry must keep awake and progressive to protect its position in the great future that will be developed by the appliance industry," Sharp told the group.

Panel predicts bright future

That the porcelain enamel industry can expect the brightest future in its history was the unanimous opinion voiced at a panel presentation and discussion at the closing session of the PEI meeting. Executives and management officers from the industry heard the panelists outline some of the major markets and fields of application which can be expected for the product in the near future.

Ernest M. Hommel, president of The O. Hommel Co., Pittsburgh, Penn., first speaker in the presentation entitled "Horizons Ahead for Porcelain Enamel," stated that the "lifetime finish" can expect more widespread use than ever before. He pointed to the expanded use of porcelain enamel on small household appliances and housewares, as well as further use on air conditioners and other major appliances. He referred to the current use of porcelain enamel on the interior of trains, and predicted its use in automobiles, street cars, and busses in the future.

Following Hommel in the program, Robert C. Myers, director of market development, U. S. Steel Corp., pointed out that the steel industry looks to a vast new market which is opening up for porcelain enamel in the field of curtain wall construction for multi-storied buildings. The steel producers are constantly expanding their physical facilities and increasing the research and

development work, Myers said. This is being done in an effort to widen the application of porcelain enamel, and to simplify production. We are entering a new era, he said, that will include:

- 1) Enameling base metal in one coat,
- 2) Enameling sheets in coils,
- 3) Aluminum coated steel for enameling.

An AIA survey shows that 99 per cent of the architects want color in curtain walls and that 95 per cent would pay a premium, he pointed out. A reasonable slice of the building market for porcelain enameled metal would mean that it would exceed all markets for porcelain enamel except appliances, he stated.

Porcelain enameling aluminum

R. F. Hafer, chief finishing engineer for Reynolds Co., next discussed the relatively new material, porcelain enamel on aluminum. (See Low Temperature Porcelain Enameling, Oct. 1956 *Finish*, page 40-46). Hafer outlined the accomplishments and current status of the recently formed Aluminum Division of PEI, which he described as a group with "faith in the future." "The future markets for porcelain components, transportation, cooking utensils, and signs are only a few of the many fields to which the material can lend itself," he pointed out. Present uses include bulkheads for naval vessels, wall tile, architectural panels, cookware, and highway and control signs. The potential could be greater than any other in the industry, he said.

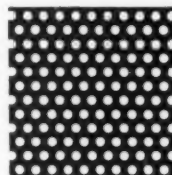
Further emphasizing the potential and future of the industry, John Winget, manager of the Marketing Service Dept., Armco Steel Corp., stated that aluminum coated steel for porcelain enameling, a recent development in the industry, offers intriguing new market possibilities in the architectural field, as well as for several other applications under current development. (Included as uses not mentioned by others are chalkboards, metal siding and roofing, permanent license plates, and range oven liners.)

Winding up the panel presentation, D. R. Goetchius, manager of Ceramic Sales of the Ferro Corp., cited recent developments within the industry, such as automatic application methods and improved equipment for firing as important accomplishments.

James W. Vicary, newly-elected president of the Institute, presided at the panel presentation and summarized the remarks in his closing talk, "The Institute's Role, Today and Tomorrow."

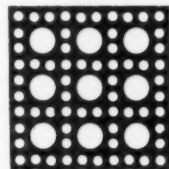
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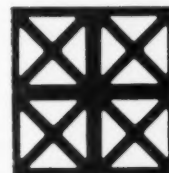
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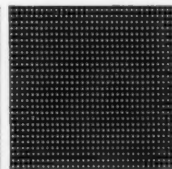
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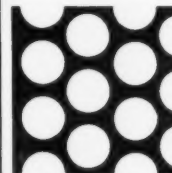
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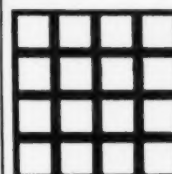
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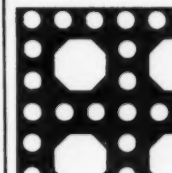
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Detergents, bleaches and washing machines

a look into the laundry room of America with analyses of situations and problems, as well as solutions, leading to better wash results

by Dorothy L. Hogg • FIELD REPRESENTATIVE, COLGATE PALMOLIVE COMPANY



MUCH CONFUSION exists today on the subject of detergents. It is understandable. The picture is constantly changing — consumer demands are changing — home laundry equipment is changing. To meet the demand, many new products have come on the market . . . too often without adequate consumer information as to type and/or job rating.

What is a detergent? The dictionary says: "a cleansing agent or solvent as water or soap". However, detergents, as we classify them today are actually synthetic detergents or syndets . . . a highly complex product made from raw materials completely modified chemically . . . usually containing derivatives of petroleum or fatty acids plus a small amount of perfume.

What's in a detergent?

Leading detergents sold today contain not only soil removal ingredients, but protective ingredients as well. Here are the six major components in heavy-duty detergents:

Active ingredients to remove soil and produce foam or suds. By themselves, these active ingredients are not powerful enough to do a heavy-duty wash, but they are adequate for light laundering or for hand dishwashing. For heavy-duty wash, a second major component is necessary — a Builder.

Builders are of two types, inorganic and organic. The inorganic builders are primarily phosphates, but they do not foam or suds. They do increase detergency. Organic builders stabilize the foam or suds of the active ingredients. Builders also act as water softeners.

Anti-redeposition agent which is needed to keep soil suspended once it has been removed.

Sodium silicate is used to protect aluminum pots and pans (when used

for hand dishwashing) and aluminum washer parts such as agitators, fins, tubs, etc., from "pitting" or attack by inorganic builders.

Brightener or Optical bleach for white effect. In daylight, there is a small amount of ultraviolet light which the eye cannot see. The brightener or optical bleach or fluorescent dye, "dyes" the fabric and converts the ultraviolet light to visible light. The end result is that the fabric appears white or brighter than it would otherwise. Bluing has long been used for somewhat the same purpose.

Corrosion inhibitor to prevent silverware from becoming stained in use for hand dishwashing.

Types of detergents

Basically, we have three types of detergents: *High-sudsing* — for use in top-loading automatics and conventional (wringer-type) washers, and for hand or tub washing. *Low-sudsing* — for use in every automatic or wringer-type washer, and for hand or tub washing. *Very low-sudsing* — for automatics or conventional washers and for tub washing. These break down into: light-duty

or neutral detergents and heavy-duty or all-purpose detergents.

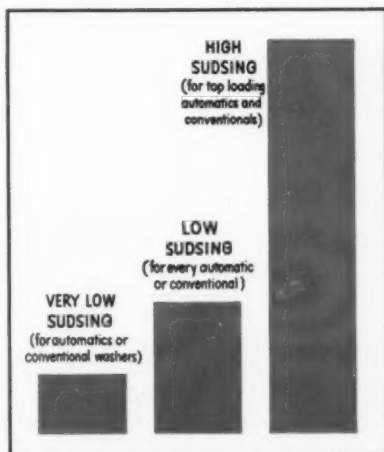
Light-duty or neutral detergents are for light hand washing, dishes, glasses, bric-a-brac, etc. They are called "neutral" because they are not chemically built, nor do they have the detergency of heavy duty products. Usable in hard or soft water, they are usually high-sudsing detergents. New liquid detergents are light-duty detergents for dishes and light laundering . . . *not for use in automatic washers or dishwashers*. Liquid detergents are favorites because of their convenience and because they require so little storage space. In 1955, liquid detergents enjoyed a five-fold sales increase over 1954.

Heavy-duty detergents are further classified as to density or gravity . . . (1) regular or spray-dried and (2) heavy-gravity or heavy-density or condensed or concentrated products.

Spray-dried products are light, free-flowing, fluffy products that dissolve readily because of an air pocket inside each detergent bubble. Heavy-gravity or condensed detergents usually differ only in density or weight from the light spray-dried detergents. Heavy-gravity detergents require a little more agitation to dissolve . . . about 1/2 or less of the heavy-gravity product is used as compared to the light or regular-gravity product. Heavy-gravity products are usually sold in different colored packages, smaller in size for the same weight as the spray-dried product. Examples are: *Ad* regular in the red package; *Ad* heavy-gravity in the blue package; *All* (condensed) in the blue package. In using these low-sudsing detergents, be sure to read the instructions as to recommended amounts to be used, and to use a standard measuring cup.

What does pH mean?

The term pH is often mentioned . . . what does this mean? The pH indicates acidity or alkalinity. Neutral detergents average from 6.8 to 8.0 and built or heavy-duty detergents from 9.0 to 12.0.



Three classifications of home laundry detergents.

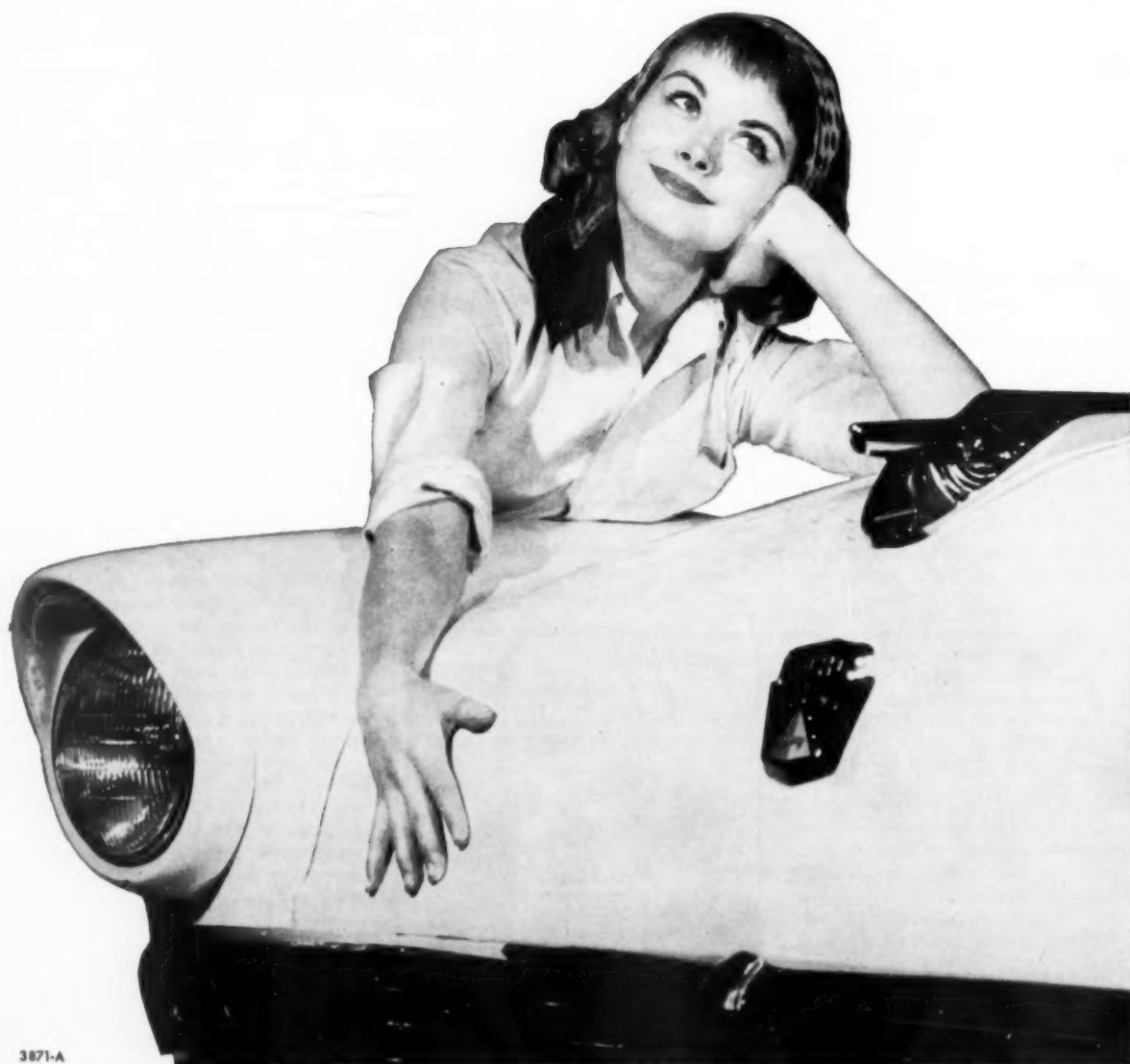
look...

it's

TITANOX®

Yes, it's the white pigment that helps make a finish that dreams are made on. TITANOX-RA-50 and TITANOX-RA-NC are the chalking-resistant rutile titanium dioxides that make white and pastel dream finishes practical.

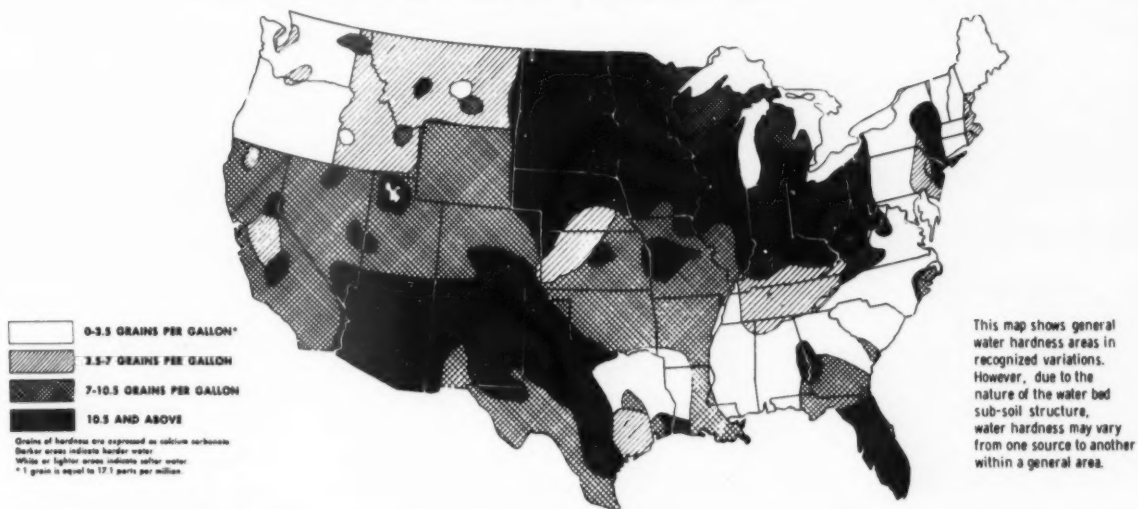
Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.



3871-A

Water Hardness Map of the United States

SHOWING VARIATIONS OF HARDNESS IN DIFFERENT AREAS



Using a ruler, think of the units from 1 to 7 as being acid, and 7 as neutral, with 7 to 14 as being alkaline. (Phenolphthalein paper tests red for alkaline, remains white for neutral or acid. This test is a quick and easy way to determine whether a detergent is chemically built and/or alkaline.)

Our skin has an average pH of 5 to 6 . . . and if detergents are not properly rinsed off the skin or hands, the pH can be increased from 1 to 2 units for about 3½ hours in most cases. So — if detergents bother your skin, be sure to rinse your hands well to lessen the possibility of irritation.

WHAT IS MEANT BY pH OF A DETERGENT ?

1 2 3 4 5 6 7 8 9 10 11 12 13 14

ACID

ALKALINE

ACIDITY or ALKALINITY

Neutral detergents average 6.8 to 8.0

Built detergents 9.0 to 12.0

Speaking of troubles, right now polished cottons surface-treated are causing headaches . . . caused by carelessness and/or lack of know-how. Polished cottons are usually treated with resins — resins of ureaformaldehyde,

melamine, or one of the “re-actant” finishes. They are used to give cotton fabrics added beauty and richness, and to provide faster washing, elimination of starching, easy ironing and resistance to creasing, mildew, perspiration and shrinking. Polished or treated cottons should be washed warm, never hot water, with detergent or soap, and dried in a warm dryer to prevent creases and wrinkles which heat and pressure may cause. *Heat softens resin finishes . . . so to retain their loveliness and beauty, handle polished cottons with care.* They are durable if handled properly; sad and costly disappointments if not properly washed and dried.

The better garment manufacturers using these polished cottons clearly state — as shown on the hangtags of *Springmaid* polished or treated cottons . . . *use no bleaches containing chlorine.* These resins cannot stand chlorine bleach.

Use of chlorine bleach

When chlorine bleach is used, ugly brown stains and streaks usually appear, and repeated attempts to bleach out those brown spots and stains only darken the damaged areas and further weaken the polished cotton fabrics. Note: Disciplined cottons differ from surface-treated cottons because “disciplining” is woven into the fabric during manufacturing to last the life of the garment. Disciplined cottons may also be washed with chlorine bleach in hot water safely.

Garment makers protect the buyer with proper hang-tag information, but unfortunately the purchaser of polished cotton by the yard does not get the same protection. The whole detergent indus-

try welcomes the day when selva edges will carry the same caution about not using chlorine bleach on polished cottons.

Several kinds of bleach are sold today — here are the major ones:

Liquid chlorine bleach — containing a solution of sodium hypochlorite stabilized with caustic. These stain . . . are hard to handle, breakage is a major hazard and a strong, pungent odor is apparent.

(New type) **dry chlorine bleach** — containing dichlorodimethyl hydantoin plus builders, detergents, softeners, and optical bleach. Release chlorine over longer period of time, dissolve more freely, have none of liquid chlorine bleach safety hazards. Far less pungent, yet heavy-duty bleaches.

Dry or liquid calcium hypochlorite — more difficult to use because hardness of water is increased. Can be dangerous, may burn holes or sometimes cause spots, wrongly classified as rust, to appear in garments if solution is not properly pre-mixed.

Dry sodium perborate — for use on animal and synthetic fibers where chlorine bleach may not be used.

Liquid hydrogen peroxide — for use on wool or protein fibers not compatible to chlorine.

Use bleach in WASH cycle

Bleaches are often used improperly — usually too often and too much. Bleaches should be used in the *washing* cycle . . . not in the *rinse* or *soak*. Why? Because bleach plus detergent produces

to Page 60 →

DETERGENTS CONTINUED

a "synergistic" effect which means that the total of the bleach plus detergent is greater than the effect of the bleach or detergent alone. If bleach is used in the soak or rinse, clothes are not bleached as much as when bleach is used in the wash cycle. *Improper use of bleach has caused greatly shortened wear-life for many items of clothing and linens, as well as costly damage to washer parts when clothes were soaked in washer tubs in a heavy chlorine bleach solution. Too much chlorine bleach can also cause "yellow build-up".*

Common types of "build-up"

I mentioned "build-up" — several kinds may occur, due to several factors. Most common are the "yellow" build-up which may be caused by excessive chlorine bleach or phosphates; "Grey" build-up due to insufficient detergency and/or poor rinsing; "Phosphate" build-up where no discoloration occurs, but where marked stiffening of towels and other deep-pile fabrics is noted.


When soap or when excessive amounts of water softener and/or chlorine bleach have been used, you may have a yellow build-up. Yellow build-up indicates undissolved or insoluble phosphates and/or chlorine bleach. Grey build-up usually indicates failure to remove soil through insufficient detergency (too little detergent or using too light a product for the soil to be removed) or through improper rinsing. Phosphate build-up can occur when excessive amounts of packaged water softeners are used, particularly when the detergent used contains a built-up water softener. (For example, in *Ad* we have an excellent built-in non-precipitating water softener requiring no additional packaged water softener. In fact, *Ad* works better alone.) When build-up occurs, don't just switch to another detergent. Remove the old detergent by "stripping out" or "conditioning" clothes. This is particularly desirable when using some of the new low-sudsing detergents for the first time. Several methods are used including:

PLAN A — When stripping out old detergent or conditioning clothes prior to using a low-sudsing detergent for the first time, use $\frac{1}{2}$ of the recommended amount of the new low-sudsing detergent . . . follow through entire washing and rinsing cycles. After final rinsing cycle has been completed run clothes through entire washing and rinsing cycles again, using the *full* amount suggested. The reason for using half the amount for stripping, out is that old detergent and/or soap, as removed, can produce suds . . . causing excessive suds level.

HOT WATER

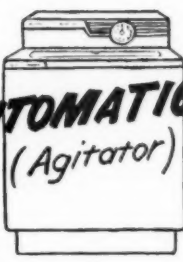
PER WASHER LOAD

(for washing and two rinses)



CONVENTIONAL

Approx. 39 gals



AUTOMATICS
(Agitator)

Approx. 22gals

BUT nearly 90% of 30-gal. and many 40-gal water heaters in homes today can't supply enough water for consecutive loads of washing.

AND 80% of water used in homes is hot - 4 out of 5 jobs call for HOT water!

2 new gas heaters (Rheem and Ruud) have two-temp settings -
180 for washing clothes and dishes
140 for general use. Today recovery speed, not size, is important.

PLAN B — Condition clothes with straight packaged water softener, allowing machine to run full washing and rinsing cycles. Follow with recommended amounts as shown on the package of detergent, running through washing and rinsing cycles.

PLAN C — (used but not recommended by washer manufacturers) Using ammonia and packaged water softener. Amounts vary as do sources, but this method is hard on clothes and washer. However, some girls still use it.

Note that whatever method is used, it may be necessary, in cases of very bad build-up, to strip-out or condition clothes more than once. This is particularly true in hard and very hard water areas where excessive amounts of soap or detergent may have been used.

Grey build-up in synthetics

Synthetic fabrics . . . particularly Nylon and Nylon blends . . . may evidence a grey build-up caused by washing lingerie in a wash bowl in warm, or cool water. The dirt in Nylon — or grey appearance — may be caused by not using a heavy-duty detergent with

sufficient soil-removal ability and/or failure to use hot enough water. Remember that Nylon filament is actually boiled during manufacturing. Dirt and lint cling to it because of static electricity. Detergents dissolve and perform better in hot water than in warm or cool water. Body oils, perspiration, etc., need not only a good detergent, but as hot water as the fabric can stand for best washing results.

Some of the synthetics—Dacron, Orlon, Vicara, Acrilan, Dynel — must be washed in warm not hot water. Some synthetics such as Orlon sweaters or some blends containing a high percentage of Orlon may "pill" or "ball" due to static electricity (which also causes colored nylons to bleed on white Nylons when washed together). Many people find that adding a small amount of detergent to the final rinse cuts down the static, eliminating or helping to lessen the "pilling" and cling. This is why more and more blends — particularly those containing Vicara (made of corn cellulose which does not seem to cause pilling) are being used . . . for greater wearing satisfaction and for easier washing.

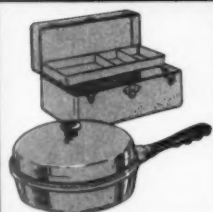
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better
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Square Finish

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Specifications for white appliance finishes

critical problems in testing discussed, procedures and pitfalls pointed out and explained in this report which is of interest to all organic finish users

by Edward G. Bobelek • PROFESSOR OF CHEMISTRY, CASE INSTITUTE OF TECHNOLOGY



The primary author of specifications is the user of the paint. This does not exclude the paint manufacturer from important cooperation in the preparation of specifications. However, the final form the specifications will take is governed largely by the needs and intent of the paint user, and the reasons he regards as important for writing those specifications will determine their final form.

In many instances the purpose is limited and simple. For example, the paint user intends only to define quality standards so as to assure uniformity of product and also to restrict competitive suppliers to a common ground so that valid comparisons can be made of prices and costs. In some instances, however, the paint user may have more complicated objectives. In addition to providing quality and cost control, the testing program becomes a part of a creative effort.

User provides stimuli

By accumulating experience from testing of many materials, and through a policy of systematic revision of specifications, a finger is maintained on the pulse of new coatings research. Thereby, encouragement is given to suppliers to perform and report research which upgrades paint properties or which results in more favorable economics.

Either purpose requires informed and realistic thinking based upon a keen appreciation of what the paint user really needs in paint properties, and also a thorough understanding of the reasons why ideal objectives cannot be realized immediately at reasonable cost.

The novice in the field of writing paint specifications tends to make two major errors. First, he may expect to deduce scientifically absolute conclusions; and secondly, he may assume that

a foolproof and simple testing schedule exists which can lead to such inflexible conclusions.

A universal and routine schedule of paint testing which efficiently classifies all types of paints on a single quality scale has not yet been devised. While it is rare for many to fall into the error of looking for a common testing program which attempts the extreme of rating by the same test procedures both white appliances and black pipe coatings, nevertheless more subtle errors are possible.

For example, just within the field of white appliance finishes different coatings are used for stoves, hot water heaters, roasters, refrigerators and kitchen cabinets. All of these coatings, which may be found in a single kitchen, are more or less white and may even be matched exactly in color shade. However, there the similarity ceases.

Many types of paint needed

In fact, there may be greater similarities of composition and properties between a white kitchen cabinet enamel and a magenta automobile finish than there are between color-matched white finishes for wall cabinets and electric roasters. While it is theoretically possible to finish all appliances with a single type of paint, such a practice would be uneconomical. Moreover, such a general purpose white paint would be a poorer coating for some items than for others.

Unless coatings design moves in directions to which it is now tending, the day cannot be foreseen when a common paint system will be appropriate to all appliances or when one common testing schedule can be used to control quality of all types of appliance finishes. The problem becomes even more complicated if a finish must be had for both metal surfaces as well as plastics, which combination is becoming increasingly important in modern design of appliances.

White baking finishes have in com-

mon the specification of whiteness retention during baking and later in service exposure. The ability to retain whiteness depends on baking temperatures used and the thermal and chemical exposure history during service. No coating now known is sufficiently resistant to discoloration for all intended uses for all appliances, but many are adequate for the limited conditions of exposure particular for each appliance type.

Balancing out needed properties

Without a doubt, the specification feature most costly to attain is color retention; the second most expensive is resistance to steam, hot water, or aqueous solutions of soap and detergent.

After that comes a variety of mechanical properties such as adhesion and flexibility which attempt to rate toughness and resistance to abrasion or chipping. Either of the desirable mechanical or chemical properties can be obtained singly at a very high level in some resinous coating types, providing that one doesn't care too much about perfection in some other properties.

For example, the ultimate of resistance to hot water can be had only if one disregards whiteness retention. The most color retentive coatings tend to have poor abrasion and chip resistance. And so it goes. The more top-notch properties that one hopes to accumulate simultaneously in a single coating, the more costly is the paint, either on the cost-per-gallon basis or, more frequently, with respect to costs of development, application, inspection, and repairs of a greater number of defective finishes.

The whole situation spells out only one conclusion: *good economics does not allow the luxury of overspecification.* For example, what may be a good whiteness retention test for roasters may provide an expensive and unnecessary overspecification for dish washers. As long as economics and practicality guide the choice of the optimum coating, there will probably be as many different fin-

ishes as there are different appliances, and each situation should be governed by specifications which fit the problem.

The accompanying figures illustrate the variability of properties and of economics for a few examples of typical appliance finishes. The choice of the test procedure is dictated ordinarily by common sense with respect to the intended application of the paint. It would be ill-advised, for example, to run color retention overbake tests at 450°F for a washing machine finish which will never suffer more than 350°F in application or service, or to make extreme demands for hot soap resistance in a cabinet finish. This is readily appreciated when the intended purpose of the coating is recognized.

Critical problem of testing

Most testing programs give ambiguous results more often for reasons of improper panel preparation than because of poor choice of quality rating tests. Most disagreements between laboratories of suppliers and users, and most instances of contradictions of duplicate

test data, spring from this cause. No particular rules can be proposed which prevent all faults in this regard, but a few important principles prevail which can serve as a check list to guide the practices used. These are:

1. *Use the application method intended for that class of paints.* Frequently there is a great difference in final paint properties, depending on whether the coating is dipped, flow coated, sprayed, or roller coated. When the paint needs to be thinned before application, insist that samples be delivered in two packages, with the proper amount of the recommended thinner in a separate package. Adhere to recommended procedure for mixing, and age the mixture for the hold-up time anticipated in production operations. These are all apparent trivia, but many a disagreement of test results comes from carelessness in these respects.

2. *Use panels cleaned by a uniform procedure and having the same age of surface preparation.* Production prepared metals are a poor choice, since the quality is too erratic. It is better to have two classes of panels, one set very

clean and another set that has a controlled degree of fouling. The former shows the comparison of coatings under ideal circumstances, while the latter demonstrates the important fact of how sensitive the coatings are to surface fouling. In many instances, the second property is the more important.

3. *Control film thickness.* Either reject from test all panels not within a specification range or, still better, try the coating at two or three different levels of film thickness. The latter procedure saves from discard many excellent materials. For example, a 3.0-3.2 mil thickness of a cheap and easy to apply coating may often do as well as 1.0-1.5 mil of a far more expensive alternate. Coatings which show no changes in the properties when film thickness varies are very rare.

Most beginners at paint testing become overly preoccupied with specialized gadgets for obtaining uniform films by procedures having no relationship to production practices. Sometimes, for less than the cost of the gadgetry, it may be easier to make more panels than are necessary using a production application

TABLE ONE

Comparison of the Relative Highs and Lows of Cost and Coating Properties for Eighteen Commercial Formulations of Coatings (on a rating scale of zero to 10, 10 represents very superior performance and zero represents total failure)

Relative Ratings of Important Film Properties

Dominant Resin Type in Coating	Probable Range of Baking Temp., °F.	Quality of Whiteness after Production Baking to Fix Film	Resistance to Additional Discoloration when Aged at Max. Baking Temp. in Column 2	Acid & Alkali Resistance	Blister Resistance in Hot Deionized Water	Resistance to Damage by Impact	Resistance to Abrasion	Resistance to Solvents and Food Stains	Relative Level of Cost per Square Foot of a 2-mil Thickness of Coating, (Compared to Alkyd = 1.00)*
Oxidizing alkyd	210-250	5	2	2	4	7	4	3	1.00
Oxidizing alkyd and melamine and/or urea	210-300	6	4	4	4	6	5	5	1.30
Non-oxidizing alkyd and melamine	280-340	10	7	5	6	4	5	4	1.50
Non-oxidizing alkyd and urea	280-320	8	5	3	4	4	4	3	1.35
Vinyl chloride-acetate copolymer	300-380	8	4	6	3	9	10	6	1.50
Acrylic type copolymers	250-375	10	9	5	6	7	6	4	4.00
Pyrenated alkyds (oxidizing)	180-250	7	4	3	3	6	3	2	1.10
Phenolic	320-380	3	7	5	9	4	8	8	1.70
Epoxy	375-400	5	7	8	8	4	9	8	2.00
Epoxy and melamine	250-340	6	8	7	6	5	7	8	1.50
Melamine and ethyl cellulose	275-340	8	6	6	5	3	6	6	1.50
Polyurethane and alkyd	150-275	4	2	5	6	8	8	5	1.60
Silicone	375-440	10	10	9	8	5	5	4	10.00
Silicone and alkyd	350-400	10	8	7	7	6	6	4	7.00
Allyl ester copolymers	320-380	10	9	8	6	2	8	9	6.00
Polyamide ("Nylon")									
10 mils, flame spray	> 550	2	6	4	10	6	10	4	5.00
Polytetrafluoroethylene ("Teflon"), flame spray	> 650	4	10	10	8	10	10	10	13.00
Polychlorofluoroethylene ("Kel-F")	> 600	4	9	9	9	10	10	10	11.00

* For example, if rating is 6.00, this means such a coating is six times as expensive as would be an alkyd resin coating; and so forth.

Note: The rating of properties are on a scale of relative comparisons. A rating of 10 represents the best performance attainable for that property in

any coating now known. A zero rating represents total failure with respect to that particular property. A rating of 4 to 5 represents fair to good.

SPECIFICATIONS CONTINUED

procedure and discard from testing such panels as fail to meet the correct thickness requirements.

4. The trickiest problem of obtaining consistent test panels is to reproduce *the proper degree of cure in the coating*. The baking requirements can change somewhat when the paint ages in the can, and only rarely do ovens at different locations exactly coincide in performance.

In the absence of some definite test (such as stain resistance to indicator dyes) which serves to track this history of the curing cycle, it is well to supplement the specification bake with sets of panels which are subjected respectively to baking times both 25% less and more than what is the recommended average.

Still better would be the practice of baking for the recommended time some

supplementary sets of panels at 15° higher and lower than the recommended temperature. This is less practical, since it would require three precision ovens. Well ventilated, dust-free ovens are the best. The sensitivity of coatings to a foul oven atmosphere is an important property which can be determined later when the number of competitive coatings has been reduced to a limited number for other reasons of quality.

Most important tests

The most important consideration of good application characteristics and lack of sensitivity to minor drifts from ideal application conditions cannot be rated precisely. However, all observations regarding these factors, even though they are qualitative comparisons with some standard, should head any report.

Most will agree that color and flexibility retention on moderate overbakes are critically important properties. Resistance to blistering when subject to humidity cabinet condensate (or a variety of other water exposure tests) provides an important index of durability. Most deteriorating chemicals which degrade coatings are most effective in aqueous solutions, and the better the blister resistance and the less the water absorption, the more likely is the film to be chemically resistant. After that it is possible to perform a wide variety of specific tests of varying merit such as adherence tests with special machines, flexibility, abrasion and impact tests for stain resistance, specific immersion tests in a variety of chemicals, and aging tests in ultraviolet.

Numerous test procedures

The detailed procedures of conducting such tests are numerous. This highly controversial art could stand considerable more discussion than is possible in this article. Whatever are the differences in effectiveness of competitive tests, it is doubtful that such differences are as important as are sound and consistent procedures for preparation of sample test panels. Where panel preparation is good (and a statistical study may be necessary to prove this point), most of ASTM or other test methods will provide facts having some significance.

Easy to be led astray

No single class of measurement is completely decisive in picking out the best coating. It is surprising, however, how an array of ill-assorted facts will sometimes lead to a hypothesis which may be as bad a steer as can be made. Less important than is the choice of tests is good judgment in their interpretation. This can come only from experience with a long sustained test program.

Until that experience becomes intrinsic to a laboratory's testing program, the only good policy is caution. Very bad coatings are easily separated from the fair to excellent, but judging moderate quality differences among good coatings becomes very difficult and should not be done with any misguided sense of scientific rectitude which is founded on premature faith in this or that single accelerated test which may be a hobby of a particular investigator. Future articles will consider some specific techniques and possible pitfalls in conducting tests from the viewpoint of defining minimum specifications for particular coating properties.

**HERE'S
WHAT
HOLDS
YOUR
PAINT
ON**

Cowles
Ty-Bond

Actual Ty-Bond Panel
magnified 10 times

Cowles Ty-Bond Zinc Phosphate Coatings give your paint, enamel, lacquer, or other finishes a base to grab and hold.

BUT IT WON'T WASTE PAINT

Cowles Ty-Bond Coatings are smooth to the touch. No deep crevices to fill. No high ridges to cover.

Gives you controlled grain structure for better adhesion without waste.

Examine this panel yourself. Send this coupon and get your Ty-Bonded Test Panel.

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Send me a Ty-Bond Test Panel

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CLEVELAND 3, OHIO

PRODUCTS and PROFITS PERK UP

WHEN GIVEN an MPc INJECTION

It's amazing how quickly a product reacts to the use of **MPc** injection molded plastics. Improved product appearance or utility stimulates sales. Lower production costs, especially when plastics replace costly metal parts, are reflected in a more favorable selling price or a longer margin of profit.

MPc is prepared to handle anything in injection molding from toy beads to large cabinets and refrigerator parts. A full battery of presses not yet one year old, with capacities ranging from 4 oz. to giant 80 oz., keeps **MPc** abreast of the most modern techniques. Mold control units assure even flow of heat to provide parts free from stress and strain. Full refrigeration facilities permit faster cycling and volume purchasing of molding materials enables **MPc** to feed machines with automatic hopper loaders. Both contribute to lower part costs.

Besides the injection molding department, the spacious new **MPc** plant houses a compression molding department with the largest presses available anywhere, and facilities for transfer molding and production of reinforced plastics-fiberglass. The experience and know-how of **MPc** engineers are yours to use. Product designers, engineers and purchasing agents are invited to submit specifications, blue prints and plastic problems for study and quotations.



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DIVISION OF ADMIRAL CORPORATION

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from the Editor's Mail

CONTINUED

Snowstorm promotion . . .

laundry appliances can best be introduced in time for mid-September retail display and fall promotion . . . and are thus still "hot" for Christmas . . . refrigerators are another matter. Refrigeration is best brought to the retail floor in the spring, and there is good evidence that fall and winter is a poor time to give refrigerators display space. Space is at a premium then, as most stores are devoting all they can to electronics . . . and we are also manufacturers of television. Electronics is primarily a fall classification, and we have traditionally brought out our major new line in July to meet the fall sales activity.

One statement in your article about people thinking, in spring and summer, "Better not buy anything now; we will need the money for vacation" . . . could to a lesser degree read with equal conviction in fall, "Better not buy anything now; we will need the money for Christmas." There is some tendency to spend more in fall than in summer, but not quite to the extent you seem to

imply, in my opinion. There are also some unanswered questions. . . "If all my new developments, and big promotional push, (to say nothing of the product involved) expend themselves at one time of the year, what do we do with the remainder of the year to maintain some semblance of stability?" As applied to our laundry operation, I therefore certainly cannot quarrel with your enthusiasm for the stepped-up fall activity that "Operation Snowstorm" could bring. We cannot, however, logically tie in our entire appliance operation into such a program. . .

W. A. Macdonough
Vice President and
Director of Advertising
Crosley and Bendix Div.
Avco Manufacturing Corp.
Cincinnati, Ohio

Ed Note: *finish* editors are highly appreciative of the reader response that reveals the stimulating analyses that arise as a result of reading "You Can Make it Operation Snowstorm," (by C. R. Sample, Managing Editor, *finish*, Sept., 1956, Page 21.) Should no greater result come about than just this critical study by each reader of his own marketing and sales plans, the editors would have been more than satisfied with the *finish* editorial project.

However, the interest aroused is indicative of the potential of such an operation as *finish* suggests. Manufacturers' dealing in multiple lines might find it at present unfeasible, but the potential of utilizing a tremendous national climate of product interest, created by the U. S. Steel program, has been receiving very serious study, the *finish* mail bag reveals.

What's your viewpoint? Send your own thoughts on the subject to the editors. If you desire additional copies of the article, we shall be glad to forward them on at your request, as long as the limited supply lasts.

Re September issue

Gentlemen: . . . very much enjoyed seeing my article, "The World can be Your Market," (*finish*, Sept., Page HL-10) on international trade in the September issue, and want to congratulate your staff on the splendid layout . . . would you send me additional copies for distribution. . . .

Richard L. Morris
Sales Manager, International
Whirlpool-Seeger Corporation
St. Joseph, Michigan

Ironer manufacturer salutes

Gentlemen: . . . your editors certainly did a wonderful job on setting this story ("Ironite's automatic ironer rental plan," Sept., Page HL-18) and the presentation was certainly well received by our company. The comment I have to make is that it was as nice a presentation of an article as I've ever seen in a trade publication . . . thank you for your sincere efforts in helping to put the ironer industry back on its feet. . . .

R. M. Gottlieb
Vice President, Sales
The Ironite Co.
Mt. Clemens, Mich.



*Our
challenge
stands*



*- anything that can
be made of steel sheets can be made of*

Believe it or not, this galvanized recessed ceiling light reflector housing was made by spinning. "Impossible," you say? "Can't be done with ordinary galvanized steel"?

You are right! It *isn't* made of ordinary galvanized steel.

It's made of Wheeling sofTITE, the tightest-coated galvanized sheet yet produced. So tight it won't chip, crack, flake or peel no matter how severely it is formed. It even takes *spinning* in its stride. In fact, *anything* that can be made of steel sheets can be made of Wheeling sofTITE.

That's sofTITE...made by the same company that developed Cop-R-Loy, the original copper-bearing steel pipe...and DUCTILLITE, the original cold reduced tin plate. Now sofTITE, the ultimate in ductile, tight-coated galvanized steel sheets...a product of Wheeling Steel Corporation, Wheeling, West Virginia.

IT'S WHEELING STEEL

WHEELING
sofTITE
©
Galvanized Sheets



District Offices — Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco



CHICAGO FURNITURE MART CLARIFIES CONTRACT POLICIES

Clarification of its policies toward contract buying was seen recently in the issuance of a new set of rules laid down by officials of the American Furniture Mart, Chicago, Ill. According to Gen. Lawrence H. Whiting, president of the Mart, the building's fundamental policy relative to contract buyers remains unchanged, but that contract business means purchasing for institutions rather than for residences. Specifically, this type of customer includes Federal, State, and Local governmental bodies, armed services, churches, schools, penal institutions, hospitals, etc. Further, the regulations state that, upon application, contract passes to building will be issued to retail dealers listed in Lyon's Red Book or Dun and Bradstreet who operate a legitimate retail store and have a stock of home goods or a warehouse.

GAS WATER HEATER SALES SHOW LARGER MODEL TREND

The trend toward larger sizes of household models of automatic gas water heaters is evidenced by a record output this year, according to Edward R. Martin, Gas Appliance Manufacturers Assn. director of marketing and statistics. Larger families, ever-growing use of washing machines and dishwashers in the home, and more attention to personal grooming were the reasons set forth for the increase in demand for hot water. During the first six months of this year, 26.2 per cent of household water heaters shipped were with tank sizes of 40 gallons or more. In 1947, the corresponding figure was only 9.2 per cent, and in 1952 it was 10 per cent. At the same time, the category of water heaters with

tank capacity of less than 30 gallons has been declining from 43.4 per cent in 1947 to 19 per cent of total shipments at the latest tally. Heaters with tank sizes of 55 gallons or more accounted for 1.7 per cent of shipments in the first half of this year, Martin pointed out.

RADIO-TELEVISION RECEIVER SALES WERE DOWN IN JULY

Fewer radio and television receivers were sold during July than in the preceding month, due to a general industry vacation period, according to the Radio-Electronic-Television Manufacturers Assn. July sales figures showed the sale of 405,310 television sets and 576,453 radios sold through retail outlets compared with 439,362 TV sets and 839,830 radios in June. Sales for the first seven months of 1956 were 3,273,560 TV sets compared with 3,584,562 units during the corresponding period in 1955. Radio set sales, in the same order, were 3,967,555, excluding auto radios, and 2,732,983 units were sold in the corresponding period in 1955, RETMA announced. However, July, 1956 sales were substantially higher than sales for the same month in 1955.

1956 VACUUM CLEANER SALES TO FINISH STRONG, SAYS LEWYT

Alex Lewyt, president of the Lewyt Corp., predicted recently before a group of sales personnel that vacuum cleaner sales for the last quarter of the year would increase about 25 per cent over the same period in 1955. Observing that there has been an average increase of 25 per cent in orders over the same month last year, Lewyt said, "Distributors are seeking greater coverage, and volume producers are stepping up their advertising, promotion, and merchandising activities." The last-quarter sales are expected to top the similar period in 1947, when the industry scored almost \$4 million in sales, Lewyt said.

KAWNEER SEES GOOD YEAR FOR ELECTRIC REFRIGERATORS

Officials of the Appliance Products Div., Kawneer Co., Cynthiana, Ky., predict a bright year ahead for the manufacturer of electric refrigerators. Advance commitments indicate "a very satisfying volume" of component parts fabricated of aluminum in the firm's two Cynthiana plants. It was further reported that contracts for next year's production have been closed with virtually all of the nation's major manufacturers of refrigerators.

BRYANT COMPANY ERECTS GLASS-ROOFED BUILDING

Something new in buildings in the Detroit area has been built by the Bryant Manufacturing Co., manufacturers of gas and oil-fired furnaces, unit heaters, space heaters, conversion burners, water heaters, and air conditioners. The entire roof of the building, in suburban Madison Heights, is made of Fiberglas Perma-Ply, a spun glass mat that combines the high strength of glass yarns with the durability of asphalt to produce a roof that is almost perfectly flat, and that holds water when it rains. Water standing on the roof, engineers explain, helps to insulate the building against summer heat, lowering the inside temperature as much as 10° under that of the outside. The office is air conditioned.

ALUMINUM, STAINLESS STEEL NEW HOME FURNISHINGS TREND

The increase in the use of aluminum and stainless steel in home decorations and furnishings was the topic of a major editorial feature in a recent issue of Look Magazine. Called the "platinum look," the silver material which was once strictly for pots and pans is now found all over the house. The use of the lightweight metal makes less work for the housewife, Look editors observe, and looks far more expensive than it really is. The increasing use of aluminum thread in upholstery and linen was also noted, along with a woven aluminum front for TV sets. Pitchers, bowls, tableware, and electric ovens are among the items fabricated from stainless steel.

FEDERAL ROLLS DOWN, STATE, LOCAL FIGURES UP

While the employment rolls of the Federal Government have decreased more than 424,000 during the last four years, State and Local Government workers continue to increase in a steady upward trend, according to figures released recently by the Research Department, Midwest Div., National Assn. of Manufacturers. Interesting to note are the statistics revealing that one out of every seven U. S. workers in non-agricultural fields, excluding the armed forces, is in Federal, State, or Local Government employ.

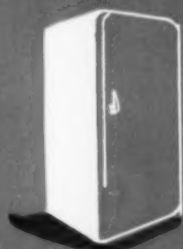
IRON FIREMAN'S BURG DIES

Clarence T. Burg, vice president, sales for Iron Fireman Mfg. Co., Cleveland, O., died August 1 at Cleveland. He had been in charge of sales since 1923 and a vice president since 1946.

Chicago Vit Service

is never further away than your phone

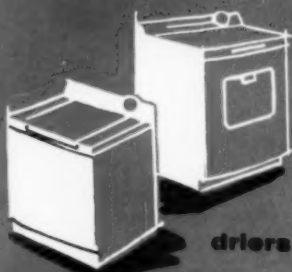
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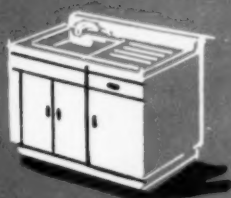
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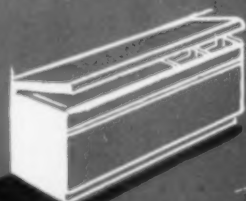
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bath-tubs



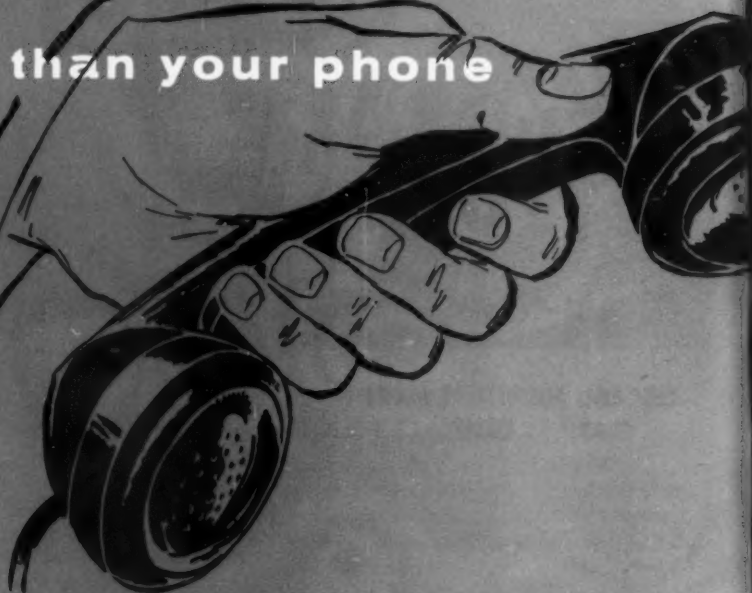
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Working side by side with enamel plant personnel is a part of Chicago Vit service that can't be measured in terms of dollars and cents. But it's important to the enamel plant operator, and it encompasses every phase of enamel processing. Chicago Vit customers have learned that this specialized service has helped them to reduce costs and increase production in many ways year in and year out. And the beauty of it all is that it's never further away than the nearest telephone.

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Chicago Vitreous

CORPORATION

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KRASBERG NEW PRESIDENT OF PRESSED METAL INSTITUTE

Bruce Krasberg, newly-elected president of Pressed Metal Institute, is president of R. Krasberg & Sons Mfg. Co., Chicago. For many years he has been active in metal working circles both in Chicago and throughout the nation. In addition to this office, Krasberg is vice president of Great Lakes Copper Mines, Ltd., Toronto, Canada, past president of Tool & Die Institute, Chicago, and past president of Men's Garden Club of America.

CENTRAL HEATING UNIT SHIPMENTS SHOW INCREASE

Manufacturers shipped 98,400 gas-fired furnaces of the forced warm air and gravity types in August. For eight months the latest total, 524,200, is 2.9 per cent over the 509,300 for the 1955 period. Gas-fired boilers accounted for 10,900 units shipped in August, and 54,300 in eight months, as against 12,500 and 49,300, respectively, a year earlier. During the first eight months of the year manufacturers shipped 104,200 gas conversion burners.

DEEP FRYERS IN SPOTLIGHT AT CHICKEN EATING CONTEST

Gas-fired deep-fat fryers are playing an increasingly important part in today's commercial cooking, according to the Gas Appliance Manufacturers Assn. Evidence of this was the Queens, N. Y. "World's Champion Chicken Eating Contest," where two 28,000-btu units browned up the 32 chicken sections downed by the winner, his 30 competitors, and many spectators.

PHILCO ELECTRIC RANGE PRODUCTION TO NASHVILLE

Philco Corp will transfer production of electric ranges from Mount Clemens, Michigan, to Nashville, Tenn., it is announced by Henry N. Hubbard, vice president in charge of electric range operations. An arrangement has been concluded with the Crosley and Bendix Home Appliances Division of Avco Mfg. Corp. whereby Philco electric ranges will be manufactured to Philco specs in Aveo's facility at Nashville, Hubbard announced. The plant at Mount Clemens will be closed.

NATIONAL P L & V MEETING

National Paint, Lacquer, and Varnish Association's 69th annual meeting, Statler Hotel, Los Angeles, California, November 12-14.

finish spotlight on new products in January issue



The spotlight will be on new models of appliances and other metal products in the January issue of *finish*, The Magazine of Appliance and Metal Products Manufacturing. Latest models will be shown pictorially and discussed. What's more, featured analyses of the progress and development in product design will be presented by one of America's leading designers. For inclusion in the new models section, *finish* editors are re-

questing that manufacturers supply, at their earliest convenience, glossy photos and detailed information on their latest models. Material or requests for more information should be directed to the attention of the Special Services Editor.

Another highlight of the issue will be a special review of the newest in components, equipment, materials and services offered to the metal fabricating industries.

STEEL KITCHEN CABINET MANUFACTURERS MEET AT CHICAGO; REPORT SALES ON THE INCREASE: UPSWING IN COLOR DEMAND

THE Steel Kitchen Cabinet Manufacturers Assn. met in Chicago, Oct. 12 to discuss cooperative activity and plan for the coming year. Reported at the meeting was that total industry sales will follow the same trend it experienced in 1955 for 1956, in spite of the reduction in number of producing companies. In an interview for *finish* editors, Assn. Secretary Arthur Tuscany reported that the current trend of steel kitchen cabinet industry sales is upward. Questioned concerning color in cabinet finishes, Tuscany stated that color use is increased with colored cabinets in color now representing about 40% of total sold. This compares with 20% of total sales in color for 1955, he said. Pastels are taking over while simulated wood finishes, considered favorably for a while by some producers, is losing ground.

Broader National promotion by the Assn. as a group is seriously being

studied, the executive secretary reported. Tuscany emphasized, however, that no such program can be finalized before the next regular meeting of the sales program.

James Lange, executive editor of *Practical Builder*, was principal speaker at the meeting. Lange stressed the changes that have taken place in the home building field, particularly in regard to the contractor and builder. Merchandising requirements were also stressed by the speaker who emphasized the importance of the "Modernization market."

"For every new house built," Lange asserted, "there is a chance for modernization of 15 old homes. The remodeling market is estimated at \$15,000,000." Lange then outlined the great opportunities for the attending members in this market, as well as in the new construction market.

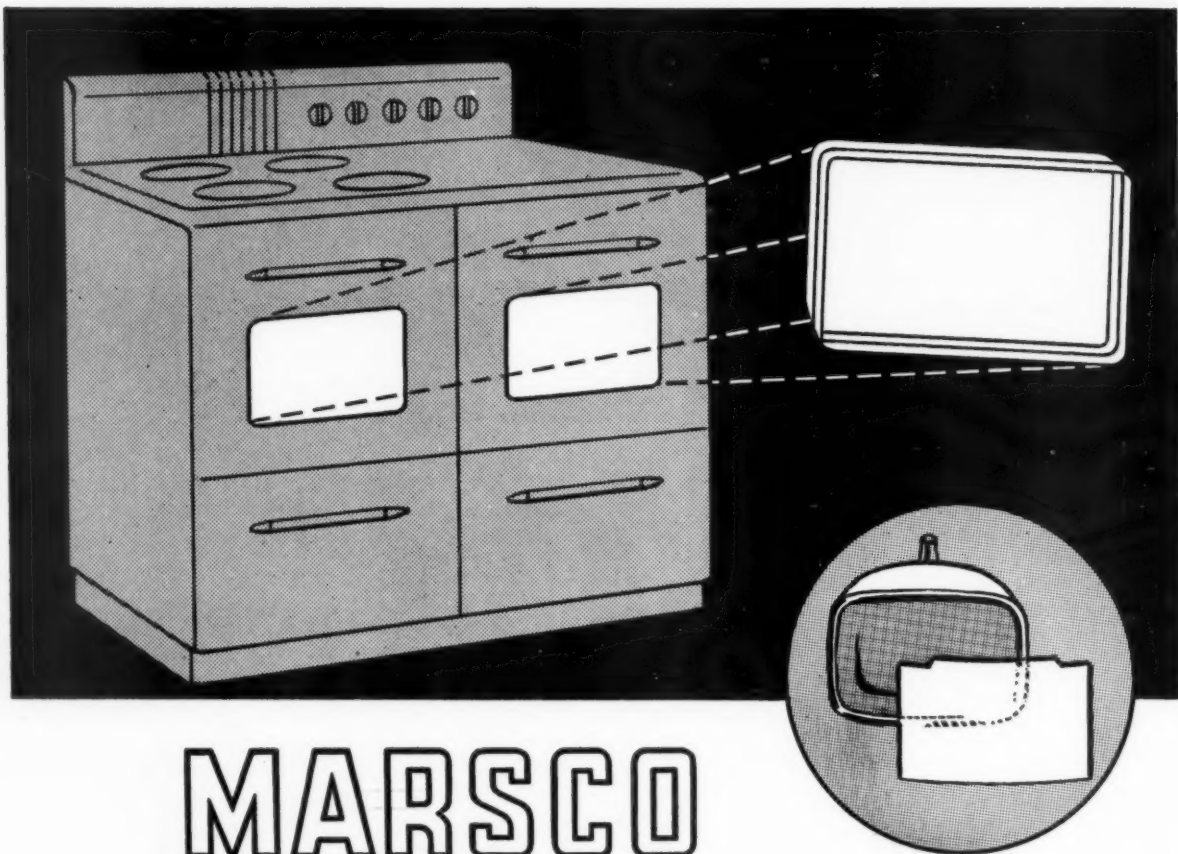
APPLIANCE MAKERS HAIL NATURAL GAS ENTRY IN WEST

Eighty thousand families in the Northwestern corner of the U. S. are now being added to the more than 26 million already connected to sources of natural gas, according to the Gas Appliance Manufacturers Assn. The move came with the conversion of Portland Gas and Coke Co. to the use of the natural fuel. The gas, being brought from the San Juan basin of New Mexico through a 1500-mile pipeline, will short-

ly be supplied to the Seattle area, last part of the United States still using manufactured gas exclusively.

NEW MIDWEST ENAMELERS CLUB '56-'57 OFFICERS ARE ANNOUNCED

Newly-elected officers of the Midwest Enamelers Club for 1956-1957 are: A. J. Holloway, president; J. A. Gustitus, vice president; S. N. Smith, secretary-treasurer; and James Tustin, ass't. secretary-treasurer. The program committee is composed of: Otto Novy, chairman, John Sincere, and Jack Davis.



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FOR UTILITY AND BEAUTY

Glass — enhances the beauty and broadens the acceptance of your product whether in the utility appliance field or the growing electronic industry.

Glass — adapted with skill and precision by MARSCO to meet your product requirements — For Today — For Tomorrow.

Glass — flat as can be — precisely shaped to fit.

Glass — bent—convex—drilled—to the most exacting tolerance.

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Join the major appliance manufacturers now enjoying extra sales from the appeal and prestige contributed thru the luster of glass — MARSCO'S Crystal Clear Glass.

Our engineers are experienced in incorporating glass as viewing windows in domestic appliances and television cabinets. A simple request to us solves your problem.



Bent Glass



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RHEEM TO PURCHASE STANDARD ENAMELING

Rheem Manufacturing Co., Chicago, plans to acquire Standard Enameling Co., Culver City, Calif., and its subsidiaries, Western-Holly Appliance Co. and Western Stove Co., Inc., under a five-year extended-payment plan, according to a recent announcement. Rheem will acquire all of the common stock of Standard Enameling and its subsidiaries. The Wedgewood division of Rheem at Newark, Calif., will be consolidated with Standard Enameling, and Wedgewood's manufacturing operations will be transferred to Standard Enameling's plants at Culver City, Calif., and McGregor, Tex., according to Richard S. Rheem, president. Manufacturing and marketing of the Wedgewood and Western-Holly lines of gas cooking ranges, furnaces, and home appliances will be expanded by Standard, and both lines will be marketed by the present sales organization.

LEWYT TO INVADE EUROPEAN MARKET WITH SWEEPER

New York industrialist Alex Lewyt will take his vacuum cleaner to Europe this fall. He will follow Martin M. Wess, newly-appointed Lewyt Corporation European representative, who will act as general liaison man for marketing and sales. Wess will conduct a series of surveys to determine manufacturing plants best qualified to be licensed to produce Lewyt cleaners. Said Lewyt, "Through our country's great communications, European women have become familiar with American made appliances and are eager to enjoy their benefits."

WAYNE EXTENDS SWEEPER PRODUCTION TO CANADA

The Wayne Manufacturing Co., Pomona, Calif., has organized a Canadian company to manufacture and sell its line of power sweepers in that country. The new corporation, Wayne-Crothers, Ltd., Toronto, is licensed to manufacture both Wayne street and industrial sweepers, and production is scheduled to begin next January.

TRANE CO. COURSE ATTRACTS ENGINEERS

The Trane Co., La Crosse, Wis., manufacturers of air conditioning and heating units, has enrolled 22 graduate engineers from 14 states and Canada in their 6-month specialized training course. The course, which is held at the

finish NOVEMBER • 1956



NEW NATIONAL PACKAGING, HANDLING, LOGISTIC ENGINEERS INSTITUTE LAUNCHES PROGRAM

Members of the newly-formed National Institute of Packaging, Handling, and Logistic Engineers hear William E. Haines, deputy assistant administrator, Business and Defense Services Administration, Department of Commerce, speak on the subject "Preventing Industrial Amnesia," which covers industrial defense planning against nuclear attack. Specific example cited by Haines was the step being taken by hundreds of individual corporations to insure continuity of management in the event losses were sustained in a nuclear war. Of major importance to the new organization, dedicated to government-industry cooperation, is the development of a more realistic understanding of governmental and industrial logistics, and phasing in the importance of proper packaging and materials handling for

the solution of logistical problems. Seated at table (l. to r.) are Philip L. Breakiron, Department of Agriculture, treasurer; Miss Dorothy Ellett, assistant to the treasurer; Thomas P. Wharton, Container Laboratories, Inc., member of advisory board; Harold M. Lovelace, Department of the Army, Deputy Chief of Staff for Logistics, vice president for logistics; Charles A. Lewis, Department of Commerce, program committee chairman; Haines, speaker; John P. Martin, Department of the Navy, corresponding secretary; Charles K. Hall, Office of Naval Material, president; Raymond F. Gochnour, Container Laboratories, Inc., secretary; Jacob Friedman, Business and Engineering consultant, membership committee chairman; and William E. Hughes, National Wooden Box Assn., vice president for packaging.

Trane company, has as its purpose the training of students in the practical engineering skill necessary for the industry before being assigned field responsibilities. The sessions are conducted twice a year and, with the new class, brings to nearly 400 the total of engineers who have participated in the "post graduate" course.

IOWA APPLIANCE DEALERS HEAR WILLIAMS, GABBERT

Approximately 200 appliance and television retailers throughout Iowa gathered in Fort Des Moines hotel recently to attend the Second Annual Iowa Appliance Dealers Assn. Profit Clinic. Principal speakers at the event were NARDA President Don Gabbert; Allan Williams, general sales manager of Motorola; Robert Boian, "Live Better Electrically;" Chester Stackpole, American Gas Assn.;

and Emmett Butler, Director of Public Relations, The Maytag Co. A. W. Bernsohn, NARDA managing director, served as meeting chairman.

AUGUST GAS RANGE SHIPMENTS REVEAL INCREASE OVER JULY

Gas range manufacturers shipped 193,400 ranges in August, according to an announcement by the Gas Appliance Manufacturers Assn. The total, which excludes built-in models, represents a seasonal increase over the 146,800 units in July, but is 12.1 per cent below the 220,000 shipped in August, 1955. During the first eight months of this year, 1,351,700 gas ranges were shipped by manufacturers, or 9.8 per cent less than the 1,499,200 units in the corresponding period last year, Edward R. Martin, GAMA director of marketing and statistics, reported.

PEOPLE AND EVENTS

(Continued)

Leonard Goland has been appointed director of research, Kellett Aircraft Corp., Camden, N. J. He previously had been a chief project engineer at Forrestal Research Center, and instructor in the graduate school, Princeton university. *Al Yackie* becomes chief of special projects, with *Blair Baisley* succeeding him as chief of structures, and *David Gebhard* has been appointed chief of preliminary design.

Robert Stoullil has been promoted to superintendent of the Plating Dept., The Maytag Co., Newton, Iowa, it has been announced by *George Alward*, general superintendent of production at Maytag's plant 2.

George M. Hartley, former sales manager of General Electric's Chemical Materials department, Schenectady, N. Y., has been appointed manager of marketing for the company's Metallurgical Products department, Detroit, according to *K. R. Beardslee*, general manager. Hartley succeeds *J. E. Weldy*, recently appointed marketing consultant for GE's Marketing Services Division, New York.

Robert Sheridan has been appointed to a newly-created post, manager of products and sales development in the commercial and residential division, Mitchell Manufacturing Co., according to *J. W. Alsdorf*, president.

Harold Haff was recently appointed to the position of specialist, refrigeration, for the midwestern sales region of Whirlpool-Seeger Corp., St. Joseph, Mich., *Jack Sparks*, general sales manager, announced. Haff formerly was general sales manager of G. W. Ontbank



NORGE AND HOTPOINT LADY ENGINEERS ATTEND NATIONAL ELECTRICAL WOMEN'S ROUND TABLE MEET; GROUP HONORS DESIGN CONSULTANT

Florence Beebe Anderson, Norge design and feature coordinator and mechanical design engineer, shows car repair wrenches to Madeline Fess Meh-

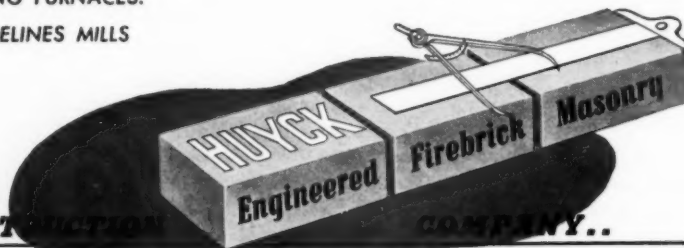
lig, kitchen design consultant, and Charlotte Brons, engineer of Hotpoint, Inc., incoming president of the Chicago chapter of National Electrical Women's Round Table, Inc. At a recent meeting, Mrs. Mehlig was awarded certificate of merit, highest EWRT award, which carries honorary life membership. Before the meeting, at which she spoke, Mrs. Anderson recalled, "I was chief wrench holder for Daddy when he repaired the family car, and always knew that some day I'd go into engineering."

Robert M. Clarke has been appointed manager of sales for the Precision Steel Corp., Bridgeport, Conn. He was formerly with the Stanley Works Steel Division.

HUYCK FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.

HUYCK LINES AND RELINES MILLS

Huyck construction



HUYCK MASONRY IS GUARANTEED TO GIVE YOU BETTER PERFORMANCE AND LONGER LIFE

1861 DeCook Avenue • Park Ridge, Illinois

POTENTIAL OF PLASTICS ARE STILL UNTAPPED, S.P.I. TOLD

Peter Schladermundt, New York industrial designer, in a talk before members of the Society of Plastics Industry at their New England Section meeting in Portsmouth, N. H., predicted that one of the most significant developments in the future of the plastics industry will be that of discovering new applications of plastics in conjunction with other media, in order to enhance the basic properties of each. "A great, and as yet virtually untapped, potential of plastics is their successful combination with other materials," he said. Schladermundt further pointed out that consumer appreciation of plastics has been handicapped by the fact that, in the earlier days of the industry, plastics were used chiefly as replacements for materials in short supply and, as a result, are still regarded as "substitutes."

ROOM AIR CONDITIONER SALES SHOW INCREASE OVER 1955

Sales of room air conditioners during the 1956 summer will exceed the 1,500,000 units forecast earlier in the year, it was reported in September, on the basis of preliminary figures gathered by the ARI. Last year's sales amounted to about 1,300,000 units. The increase, representing a gain of more than 15 per cent, could have been much greater had the cool weather not prevailed throughout most of the country during July and August.

MERGER OF PATTERSON, FERRO FIRMS ANNOUNCED

Merger of the Patterson Machine & Foundry Co., East Liverpool, Ohio, with Ferro Corp., Cleveland, has been announced by Richard L. Cawood of the Patterson firm. With the retirement of Cawood as president, I. T. Marks, Ferro executive vice president, announced the appointment of C. W. Gerter as president of Patterson.

NAMA LAUNCHES 1956 MEMBERSHIP CAMPAIGN

The 1956 National Automatic Merchandising Assn.'s campaign to enroll 300 new operator members is under way, according to Ernest H. Fox, Austin Packing Co., Baltimore, Md., general chairman of the drive. Nearly 1,000 member operators and sales representatives of member manufacturers and suppliers are combining their efforts to make the drive the greatest in NAMA

history. Attention will be focused on the heavily populated areas of the U. S., making it possible for state and local chairmen to meet reasonable goals. Members are using a "Here's How" theme, and a newly-designed brochure has gone out describing how NAMA is actively working for everyone in the vending industry.

FEDERAL TRADE COMMISSION DECIDES ON "PORCENAMEL"

The recent Federal Trade Commission decision setting forth a Cease and Desist order against a company's use of the term "Porcenamel" to identify its organic paint finish is of great importance to the porcelain enameling industry, according to John C. Oliver, managing director of the Porcelain Enamel Institute. The 17-page initial decision, ren-

dered by the commission against Arrow Metal Products Corp. on Aug. 17, 1956, climaxes more than two years of work begun by the PEI early in 1954.

WHIRLPOOL-SEGER PLANS FULL APPLIANCE LINE FOR EARLY '57

If current field tests on several new products back up laboratory studies, Whirlpool-Seeger Corp. hopes to have a complete line of major home appliances ready for the market early in 1957, according to Elisha Gray, president. Production facilities are being stepped up, with one new plant and two additions to present factories being readied to meet an expected heavier load. Among the new products soon to be marketed is an electronic range, a combination washer-dryer, and a new line of refrigerators.

Less than 5% Ripple

TECHNIC Germanium Diode Rectifier for Precious Metal Electroplating

Technic presents the first 150 amp. single phase germanium rectifier with less than 5% ripple — of special importance in specification electroplating. Meets NEMA Standards.

Heavy duty germanium diodes rated 700 amps — give full operating efficiency over entire load range, assure long life.

0 to 10 volt full Powerstat con-

trol; fused circuit with circuit breaker overload protection; dual ammeters; volt meter.

Small overall size — 20" x 15" x 18" — saves costly space for profitable production. Fully guaranteed against defects under normal operation. Recommended for all precision electroplating, especially precious metals. Data Sheet available.



TECHNIC, INC.

39 Snow St., Providence, R. I. — Jackson 1-4200
Chicago Office — 7001 North Clark Street

THE LARGEST ENTERPRISE OF ITS KIND IN THE WORLD



Bulman CORPORATION

uses tough custom finishes* and store styling service as key sales features

Proper use of color is a vital part of any successful self-selection plan. That's why the Bulman Corporation takes full advantage of our styling service. Our studio created the soft pastel colors for the equipment, as well as a comprehensive styling coordinator for the store itself. It is a profitable combination that attracts customers and emphasizes merchandise. Best of all, this beauty is backed by practicality, since Bulman's baked enamel outlasts competitive finishes three times over!



GRAND RAPIDS VARNISH CORPORATION

Grand Rapids, Michigan

Makers of the Famous [®]Guardsman Finish and [®]Guardsman Cleaning Polish

THE BETTER THE FINISH, THE BETTER THE BUY

New

Supplies and Equipment



NEW 3/4" GENERAL PURPOSE SHUT-OFF SOLENOID VALVE

A new 3/4" general purpose 2-way solenoid valve with a full area port has been introduced. This new self-contained, internal pilot operated solenoid valve has a forged brass body and bonnet and a hycar diaphragm. Available normally closed, opens when solenoid is energized, or normally open, opens when solenoid is de-energized, this valve can be mounted in any position. Just three operating parts are utilized — a stainless steel core and spring, and a hycar diaphragm. Packless construction is used; no stuffing boxes or sliding glands to leak or require maintenance are needed. Valve handles oil, water, gas, etc., up to 125 psi. Continuous duty Class A coils require just 10.5 watts a-c or 10 watts d-c to operate. Available with either pressed steel, water-tight, or explosion-proof solenoid enclosure. Explosion-proof enclosures are "UL" approved and listed for Class I, Group D, and Class II, Groups E, F and G hazardous locations. Luxolene molded coils for extreme humid or moisture conditions and dual voltage coils can be provided.

(Check No. 931 on Service Coupon)

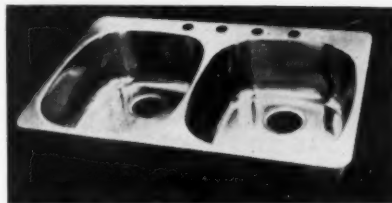
BARREL FINISHING

New Comprehensive in coverage, the catalog explains in detail with many illustrations, the many types of equipment available to manufacturers who plan the use of barrel finishing as a plant operation. The units shown are of such a wide variety that every plant, large or small, will find the equipment best suited to their requirements in one of the catalogs.

(Check No. 932 on Service Coupon)

DISTINCTIVE NEW DESIGN IN STAINLESS SINK BOWLS

A new sink bowl line of stainless steel has been announced. Most obvious of the new features is the distinctive shape of the bowls, a graceful square oval that is pleasing to the eye, modern, and easy to clean. A gleaming satin finish protects the bowls from the scratches that mar sinks with a mirror-like surface. This satin finish has been proved more sanitary than the mirror finish. Another advance is the use of stainless chrome steel instead of nickel stainless. Drawing was easier with nickel steel, but the metal was reduced to a thinner gauge at critical stress points. With new dies and drawing equipment, deep-drawing chrome steel is done successfully. The metal literally flows, to maintain an even 20 gauge thickness at every point.



These stainless sinks are available in single bowls (21" x 24") and double bowls (21" x 32"). In double bowls, the oval design leaves a thinner dividing wall to reduce splash from a swinging faucet. All are undercoated with a rubberized sound-deadener. Installation with an exclusive design sink frame assures the manufacturer a perfect matching of metal "color".

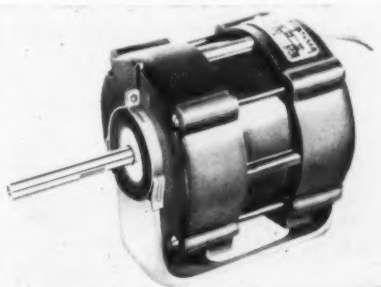
(Check No. 933 on Service Coupon)

"VISIBLE GRINDING" EXPLAINED

New A new grinding method which permits the operator to see right through the grinding wheel, is described in an attractive 4 page brochure. A complete description of the new grinder system is given.

(Check No. 934 on Service Coupon)

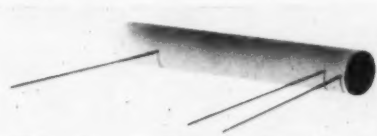
F.H.P. INDUCTION MOTOR



Now available, a fractional h.p. induction sleeve bearing motor features an open, self-ventilated frame for cool operation. It is available for pad mounting, resilient ring mounting or end mounting. The rating range (continuous duty) is: permanent split capacitor single phase: 50, 60, 120 cycle, 2, 4, 6 poles induction: 1/150 to 1/50 h.p., 2, 4, 6 poles synchronous: 1/250 to 1/60 h.p.; polyphase (2 or 3 phase) 50, 60, 120 cycle, 2, 4 poles induction 1/150 to 1/60 h.p., 2, 4 poles synchronous: 1/250 to 1/80 h.p.

(Check No. 935 on Service Coupon)

LONG-CONSTANT DELAY TIMERS



A new series of custom-designed, long delay-high impedance, distributed constant delay networks is available. Constructed with radial leads for printed board wiring, these timing units can be supplied to meet commercial requirements or military specifications. The units can be provided in hermetically sealed cases, as well as with terminals arranged to conform exactly with specific printed circuit board requirements. Flexibility of application is another feature. These units can be stacked in series to obtain longer timing intervals. Delay time and impedance, as well as all mechanical and electrical characteristics, can be varied to meet application requirements.

(Check No. 936 on Service Coupon)

METALLIC ABRASIVES

New An eighteen page, two color catalog on a line of metallic abrasives has been published that discusses the laboratory facilities available, presents technical data, and illustrates various types of shot and grit produced. The various types of cleaning and peening methods are also discussed.

(Check No. 937 on Service Coupon)

Best pre-porcelain spray cleaner yet!

Pennsalt Cleaner 38

Controlled-foam alkaline action sprays away finishing rejects

Vitreous and Organic Finishers:

Here's a single low-cost spray cleaner for tough work, a cleaner that will cut your rejects and operating costs 'way down—Pennsalt Cleaner 38!

No need for involved cleaning cycles and costly emulsion-alkali combinations. New Pennsalt Cleaner 38 gets under impacted soils once considered immovable. You buy only cleaner, no water—this one anhydrous material

takes up far less storage space, and costs you far less pound for pound. It's easy to control your cleaning operation and solution with 38 . . . savings in supervision and production time are added to your initial saving in materials.

Call the Pennsalt man for a plant test of Pennsalt Cleaner 38 on your grimeiest pre-porcelain-enamel or pre-paint cleaning job. Or write your problem direct to Metal Processing Dept. 319,

Pennsylvania Salt Manufacturing Company. East: Three Penn Center Plaza, Philadelphia 2, Pa.; West: 2020 Milvia Street, Berkeley 4, Calif. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.



Metal Cleaners • Phosphate Coatings • Cold-Working Lubricants

A B E T T E R S T A R T F O R Y O U R F I N I S H

MICRO-SIZE SOCKET SCREW



Micro sizes, from #0 through #3 of socket cap and set screws, completing a standard range of socket cap sizes up to 3 1/2" in diameter and of socket sets up to 1 1/4" are available. In addition to cup points, cone, oval, half-dog and flat points are now available on the alloy steel set screws. Socket cap and set screws in the new stainless line are made of 18-8 stainless steel, are non-heat-treated and non-magnetic. The cap screws, with knurled head for sure grip, come in diameter sizes from #0 to 5/8 of an inch. Fully formed threads are unified. Fit is 3A. Stainless set screws are available in sizes from #0 through 1/2" and come with cup point.

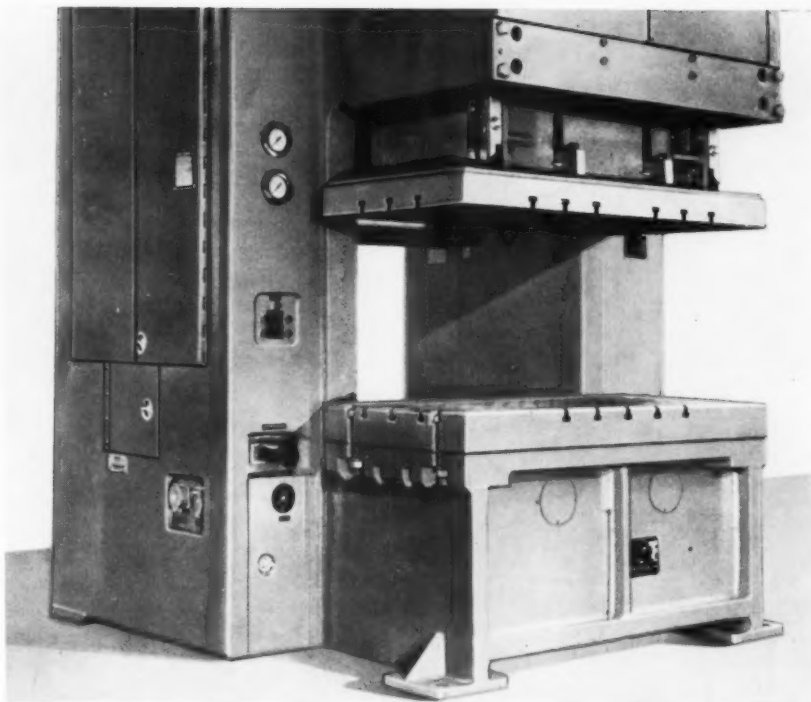
(Check No. 938 on Service Coupon)

NEW FASTENING WASHERS SEALS, LOCKS, INSULATES



A revolutionary new fastening improvement made from DuPont's "Zytel" nylon, rolled washers, are slipped over the bolt, screw, rivet or nail and when pressure is applied to tighten the fastener, the rolled washer "cold-flows" around the fastening device and under the fastener head. The product's unique hugging qualities fill all space between threads and hole providing perfect airtight, leak-proof seals. The controlled flow washers also act as a locking device, prevent galling, and dampen the effect of vibration. The multiple function rolled washers can be used with virtually any fastening agent.

(Check No. 939 on Service Coupon)



NEW, COMPLETELY ENCLOSED "STREAMLINED" GAP PRESS LOADED WITH NEW FEATURES

A new "streamlined" gap press features totally enclosed piping and wiring of all air, lubrication and electrical components. In addition, gears, flywheel, clutch and all other moving parts are fully enclosed, incorporating safety and convenience features to protect both operator and press. Die space area of the new gap press is well lighted for working convenience and there are receptacles and pockets for safety blocks to prevent the press from operating while men are working in danger areas. 440 and 110 volt service outlets provide power for portable electric service tools . . . and a self contained air supply sys-

tem provides air-powered service outlets. Exact position of the ram at any point in the stroke is shown by an electric indicator. The press contains a completely automatic lubrication system with all gears totally enclosed and running in oil. A central lifting hook on the press simplifies setting and moving the press. It is even possible to have the press moved from position to position for convenient location set-ups on special jobs. The complete electrical control system includes extra outlets and cams for tying press into automation lines.

(Check No. 940 on Service Coupon)

DOUBLE FACED TAPES

Two thin but tough double faced tapes, suited as agents in many laminating and splicing operations, have been announced. The tapes are made with DuPont's polyester Mylar for backing, with heat curing adhesive which has excellent pressure sensitive characteristics in its uncured state. With a heat cure, the adhesive is bonded to the surface to which it is applied more firmly and becomes resistant to paint and varnish solvents. Low adhesion of the interliner to the tape permits quick, easy removal. The tapes lend themselves easily to die cutting to fit irregular shapes and surfaces. They are practicable for laminating thin sheets of either like or dissimilar metals where paper or cloth back-

ings would not be too desirable. The inert nature and thinness of the tapes make them useful as a splicing agent in cases where a further processing operation is involved or the thickness of the splice is of major importance.

(Check No. 941 on Service Coupon)

HAND BENDING BRAKES

New A new 8-page folder, describes a complete line of hand-operated bending brakes. The folder gives specifications on standard brakes, universal box and pan brakes, portable brakes, and folder brakes. Illustrated also are some of the special bending brakes that have been built for particular bending operations.

(Check No. 942 on Service Coupon)



...a name you'll find
in America's leading
metalworking plants!



Photo of Finish Bake Oven
Jones and Laughlin Barrel Plant

DESPATCH FINISHING SYSTEMS

DO THE JOB BETTER. For over 54 years Despatch has designed, built and installed systems for finishing metals. As new techniques have been developed, they have been tested and when approved, applied by Despatch to give industry the most advanced methods of producing modern finishes on metals. From laboratory ovens to huge production systems, you will see the Despatch label on finishing equipment in leading metalworking companies.

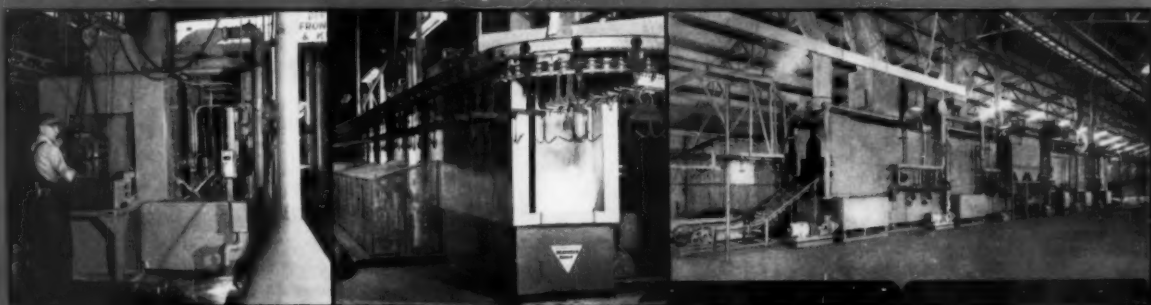


Write today for Bulletin 51—This beautiful full color brochure shows important installations with data, or refer to Sweets Mechanical Engineering File.

2-Stage Washer

3-Stage Washer

5-Stage Washer



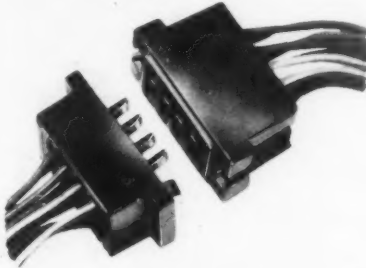
Minneapolis Office: — 619 S.E. 9th St.
Sales and Service in All Principal Cities

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

DESPATCH
OVEN COMPANY

LOW-COST PLUG & RECEPTACLE

These new, low-cost units feature fast, simple assembly for use in major appliances, electronics, machinery or any application requiring multiple circuit hook-ups. Crimped terminals for snap-in assembly eliminates time consuming soldering and cuts assembly costs by



as much as 75%. Terminals are available individually or in reels for automatic machine assembly to wires. Rated up to 15 amps per terminal, they are molded from an exclusive compound (U.L. approved) which provides good electrical and physical properties, plus dimensional stability and low moisture absorption. This plastic is also used for the "quick-connect" mating terminal blocks which accept the standard type female connectors. Stock or custom units are available to specifications in a variety of patterns and sizes, featuring an exclusive integral screw type terminal for high amperage connections.

(Check No. 943 on Service Coupon)

RECOMMENDED WELDING

New A booklet, "Recommended Practice for the Welding of Steel Castings", ordinarily selling for 35¢, has been made available to readers of *finish*. Copies are limited, so it's a first-come, first-served basis. The book's preface states: "The recommended practices outlined in the report are as adaptable to the fabricator as they are to the steel foundryman," and, "the report should be assigned to the individual in the plant who is responsible for welding quality."

(Check No. 944 on Service Coupon)

OVEN BROILER INFINITE CONTROL

Accurate regulation and control of inputs up to 3000 watts is provided by a new range switch designed specifically for oven broiler applications. The control permits instant adjustment to any recommended broiling input. It can be used on either standard oven broilers or those featuring rotating or fixed rotisseries. The new switch incorporates an infinite control feature which provides

an unlimited number of heat settings between high and low. With only three detents positioned 45° apart ("high", "off", "low") maximum heat selection is assured. Control can be rotated in either a clockwise or counter-clockwise direction. Automatic compensation for ambient temperatures as high as 180°F provides an even distribution of heat over the entire broiler element. This unit is adaptable to practically any design requirement and comes complete with sleeve mountings. Shaft dimensions can be provided per requirements.

(Check No. 945 on Service Coupon)

USE OF SLOTTED ANGLE

New Scores of ideas on using slotted angle bars are contained in a new booklet. Photographs and descriptions of current commercial and industrial applications show the versatility, strength and economy for a wide variety of plant maintenance and equipment needs, shelving, racks and stands. Accessories which add to the usefulness of angle iron are shown.

(Check No. 946 on Service Coupon)

PLASTIC MOLDING BROCHURE

"Facilities and Services" is the title of a new 16-page brochure brought out by Molded Products, Division of Admiral Corp. Intended for those concerned with plastic molding, the booklet pictorially and graphically provides a tour through the new MPc plant located on a 19-acre tract in West Chicago, Ill. Highlighted through the pages are some of the extraordinary facilities and services which have made possible MPc's high rank among plastic molders.

(Check No. 947 on Service Coupon)

HIGH DENSITY LIFTER BARS



New high density lifter bars are said to be harder and tougher than regular vitreous porcelain and more resistant to mechanical shock and abrasion. They may be installed with regular porcelain lining, and are available for use with 1", 1½", 2" and 2½" mill linings.

(Check No. 948 on Service Coupon)

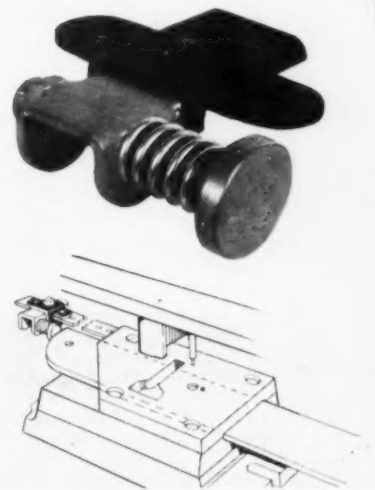
GAUGES AND GAUGE INFORMATION

New 48 page illustrated catalog containing complete specifications and prices on an entire line of gauges. Each standard gauge section contains complete specifications and ordering information including styles, gauging surfaces, size ranges, tolerance classifications and prices. Also included is a separate section covering many types of special, non-standard gauges. In addition, a special "Technical Data" section provides a convenient source of practical gauging information such as wear allowance and gaugemakers' tolerance charts, ordnance tolerance tables and a resume of gauges and gauging practices.

(Check No. 949 on Service Coupon)

LOW COST DIE STOP

A new and low cost die stop has been perfected and is priced very low, even in small quantities. It can be installed in minutes on any die, is adjustable two



ways for any parting die operation, and is adaptable for any cut-off operation such as parting dies, cut-off saws, etc. It is installed by simply drilling one screw hole plus two dowel holes on the back rail of the die, screwing the die stop in position and anchoring it with dowel pins to hold it steady. A few seconds spent in adjusting the stop by sliding it into position and tightening the lock screw, then making fine adjustments for length by turning the lock nut on the top shaft and the all steel die stop is ready for use. The square shaft prevents rotation while fine adjustments are being made. It can be reused many times and transferred from die to die.

(Check No. 950 on Service Coupon)

BURDETT OVEN **Saved \$4,160⁰⁵ in 6 Months** *Says: "Famous Name" Manufacturer of* **Steel Store Equipment**

We greatly appreciate this factual testimonial by the Bulman Corporation of Grand Rapids, Michigan.

They write:

"We have not only realized a substantial reduction in operating cost but a finer paint baking finish thereby improved our quality."

"We are very happy with our selection, because it has provided service beyond our expectation."

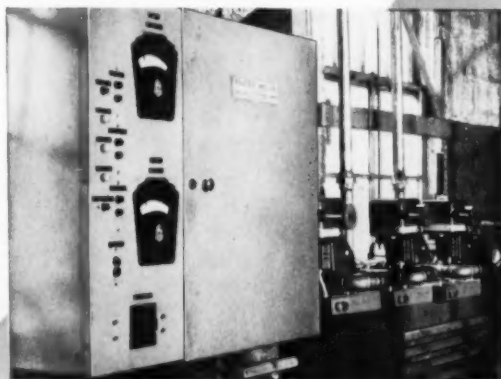
Look at these 6 months results

Net power savings—Burdett vs.	
former electric ovens.....	\$2,808.43
Savings in paint.....	1,351.62
Total savings with Burdett Ovens.....	\$4,160.05

Also

Production increased from 133 pieces per hour to 186 pieces per hour—(424 pieces per day)—39% production increase with same labor.

Can you beat this?
If not—install Burdett
Gas-Fired Radiant Heat Equipment



We invite
your inquiry
for complete
details



Write for full information
without delay

Write for the Burdett story!

BURDETT
 MANUFACTURING COMPANY

4918 South Monitor Avenue, Chicago 38, Illinois

DETROIT

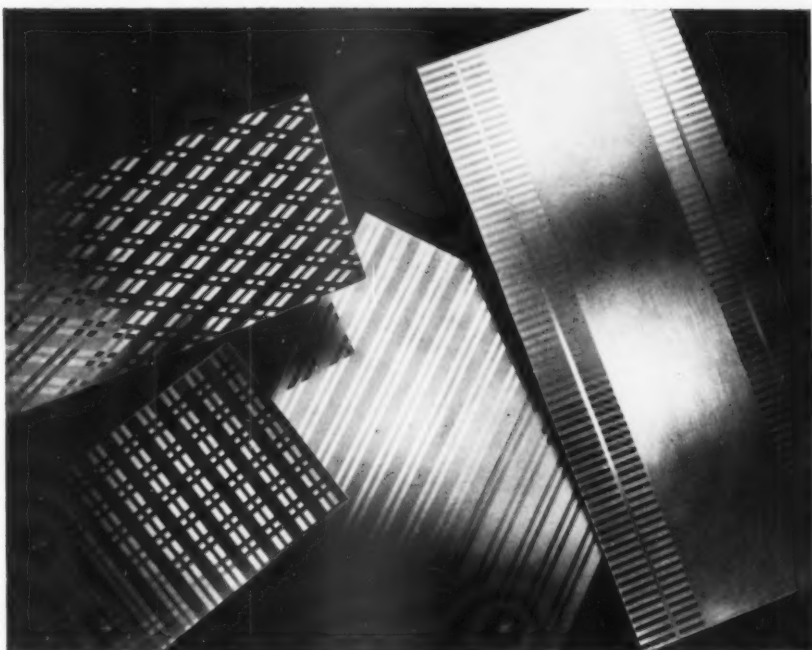
PHILADELPHIA

NEW YORK

CLEVELAND

DALLAS

Manufacturers of
 COMPLETE FINISHING SYSTEMS — "RADIANT-HEAT" SYSTEMS, OVENS, HEATERS,
 AIR MAKE-UP UNITS, SPRAY BOOTHS AND WASHERS



WIDE VARIETY AVAILABLE ON PRE-FINISHED METALS

Now there's almost no end to the number of distinctive patterns that can be applied to pre-finished metals. These metals, available in economical sheets, strips or coils, can be used for complete product fabrication of small units, as well as for trim or paneling on larger appliances such as ranges and refrigerators. Adding to distinctive styling in product design, these patterns insure a lasting beauty during product service life. Barely perceptible to the touch, they are an integral part of the metal after finishing. The almost infinite variety of patterns, stripes in all types

of arrangements, combinations and widths (also crimps) are possible as the result of years of experience and research behind modern metal finishing. New developments, modern facilities and mass production methods combine to keep the cost of such mechanically finished metals well within reach of small or large manufacturers. In addition, pre-finished metals afford substantial production economies over individual piece plating or finishing methods.

(Check No. 1048 on Service Coupon)

RESISTANCE WELDERS

New A new six-page bulletin covering a complete line of resistance welders is offered. In addition to standard and semi-standard line of resistance welders, the bulletin describes precision specials, designed and tooled to solve specific and unusual production problems.

(Check No. 1049 on Service Coupon)

CERAMIC PIGMENTS COLOR CHART

New A new color chart folder which illustrates the colors of inorganic pigments is now available. This color chart folder gives data and specifications concerning the various inorganic colors such as: specific gravity, bulk density fineness residue on 325 mesh screen, oil absorption and composition.

(Check No. 1050 on Service Coupon)

PAINT WORK BOOK

New Publication of a new paint manual, designed for use as a practical work book, presents useful painting data in the form of charts, tables, diagrams and illustrations. Virtually all factors relating to the use of protective coatings in mild to severe corrosive service are covered in detail. Care and cleaning of brushes and spray equipment is explained. Also discussed is a proven method of successfully priming rusty surfaces without previous surface preparation using a "no-prep" primer.

(Check No. 1051 on Service Coupon)

SHOCK AND ABRASION CUSHIONS

New Two products, hitherto unidentified with the packaging field, have aroused considerable interest among packaging engineers who have seen demonstrations of their versatility. The cushioning is oval in shape and consists of a core of waffle paper especially formed to resist crushing and packing. Two jute centered edge ropes are sewed into the unit, allowing it to be quickly stapled or tacked to a flat surface. Pounding tests have proven it can withstand heavy shock and spring back without crushing. This feature makes it practical as a cushioning agent against shock and abrasion. The edging is of such construction that it can be reused several times. It is believed, too, that the new products can eliminate a great deal of bulky packaging of materials and cut down on material and application costs.

(Check No. 1052 on Service Coupon)

FINISH
York Street at Park Avenue
Elmhurst, Illinois

NOVEMBER

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

931	936	941	946	1048
932	937	942	947	1049
933	938	943	948	1050
934	939	944	949	1051
935	940	945	950	1052

Name _____ Title _____

Company _____

Company Address _____

City _____ Zone _____ State _____



Rigid Quality Control



COLD ROLLED STRIP
by
FOLLANSBEE

FOLLANSBEE has been able to maintain its reputation for quality strip steel only by strict control through every phase of production. The steel for your order is yours from the moment Follansbee mill operators begin to fashion it to your specifications.

Your Follansbee representative, knowing that the plant will always deliver a quality order, concentrates on being of service to you. Why not get in touch with him before you place your next order for strip steel.

FOLLANSBEE

STEEL CORPORATION



FOLLANSBEE, WEST VIRGINIA

Cold Rolled Strip • Terne Roll Roofing • Polished Blue Sheets and Coils
Sales Offices in Principal Cities

PEOPLE AND EVENTS

Ellis F. Farrell has been appointed assistant general manager of paint sales for the merchandising division, Pittsburgh Plate Glass Co., according to *Guy Berghoff*, general manager of paint sales for the division. *Richard P. Bell*, who formerly held Farrell's post, has been appointed assistant to the president. Prior to his appointment Farrell had served as manager of the firm's Syracuse, N. Y., distributing branch for the past three years.

Nicholas M. Esposito has been named to fill the newly-created post of production manager at the H. W. Loud Machine Works, Inc., Pomona, Calif., it is announced by *Alanson R. Loud*, president. Esposito will have full charge of Loud's production planning, scheduling, and control.

Carter L. Redd has been elected as commercial vice president for the South-eastern district, General Electric Co., Schenectady, N.Y. Redd, formerly District Apparatus sales manager, succeeds *Claud J. Hendon*, who is retiring.

Edwin J. Blanning has been appointed assistant to general superintendent-cost improvement, Gary Steel Works, United States Steel Corp., according to an announcement by *John H. Vohr*, general superintendent. *Harry S. Spitz* succeeds Blanning in the post of division superintendent-central mills.

Andrew H. Kelly has been appointed to the Industrial Sales staff of the Benjamin Franklin Paint and Varnish Co., it has been announced by *Ed. H. Bucy*, general sales manager of the firm. Kelly, who has had over twenty years experience in sales and service work, will have as his territory portions of Northern New Jersey, Delaware, and Eastern Pennsylvania.

E. A. Irion has been named a district application engineer in its Pittsburgh office by the Clark Controller Co., Cleveland, O., manufacturer of industrial electrical control equipment.

Douglas F. Woolley, Jr., has been promoted to sales engineer of Pennsalt Chemicals' Corrosion Engineering department, Philadelphia, Penn. Woolley, according to Corrosion Engineering Sales Manager *Robert R. Pierce*, will

specialize in assistance on corrosion problems in fields where application of Pennsalt's line of corrosion-resistant coatings, linings, interlinings, and acid proof cement mortars are recommended.

W. W. Gilmore has been elected a vice president of the Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. Gilmore will continue as president of Micro Switch, a division of the company at Freeport, Ill.

G. J. Crowdes has been appointed district manager in charge of the Dennis Chemical Co.'s Ohio regional office. Crowdes will serve the Eastern area, which includes Ohio, Pennsylvania, New York, and Michigan, from headquarters in Cuyahoga Falls, O.

Elbert D. Peck, 67, vice president in charge of Pittsburgh Plate Glass Co., paint and brush division, died recently in West Penn hospital, Pittsburgh. Surviving him are his widow and a brother. Interment was in Kensico cemetery, Valhalla, N. Y.

Robert J. Korbobo has accepted a post as a Marine Sales Engineer with the

Theodore W. Bossert has been appointed chief metallurgist of Aluminum Co. of America, according to a recent announcement by *C. F. Nagel, Jr.*, vice president. Bossert has been serving as assistant chief metallurgist since 1951, and will now head the metallurgical division of the operating department. He received his B.S. degree from Massachusetts Tech. in 1921.

Gale Blakeslee has been elected president of G. S. Blakeslee & Co., it was recently announced. He succeeds *G. R. Blakeslee*, now chairman of the board, and will be responsible for the administration of both divisions of the firm.

New York office of General Electric Co.'s Aviation and Defense Industries Sales Dept., Northeastern District. Korbobo was formerly with the Marketing Section of GE's small steam turbine dept.

Don Smith, formerly employed by Kelvinator, has joined Ferro Corp., and will work out of the Chicago sales office on the frit sales and service staff.

Edward L. Shepherd has joined the sales staff of Pyramid Mouldings, Inc., Chicago. He was formerly sales manager of The Grigoleit Co., Decatur, Ill.

Mason M. Randle has been appointed quality control manager for the Western Brass Mills Division, Olin Mathieson Chemical Corp., *J. E. Williams*, vice president and general manager, announced recently.

C. Brooks Ricca has been named Philadelphia District sales manager of Pennsalt Chemicals' metal processing products, and *James Carlin* has been assigned to the field sales staff, according to an announcement by Department Manager *John M. Davidson*.

Mearl K. Shetler has been appointed to the new position of Regional sales manager, Coated Abrasives Division, Armour and Co., Alliance, O. Shetler will supervise all sales for industrial coated abrasives for central Ohio.

R. D. Jones has been appointed general sales manager of the Automatic Transportation Co., Chicago, manufacturers of electric industrial lift trucks, it has been announced by *Roy L. Wolter*, general manager.

Robert J. Laws has been named assistant chief engineer of the Baker-Raulang Co., Cleveland, Ohio, manufacturers of materials handling trucks. *Ralph C. Reinhart* has been named director of manufacturing.



ELLIS FARRELL



G. BLAKESLEE



**NEW NON-POROUS
STEATITE CERAMIC . . .**
moisture-resistant in
high-humidity atmosphere

Hyphelkrom

A new non-porous ceramic now makes
"V" Saddle-Loop insulators more moisture-resistant and more
efficient in high-humidity atmosphere than ever
before. Exhaustive independent research tests prove
they reduce the possibility of current
leakage due to moisture absorption
to a degree of efficiency never
attainable in the past. A new
exclusive feature found only in
"V" Saddle-Loop Heating Elements.

H. W. TUTTLE & CO.
Adrian, Michigan

*Manufactured and distributed in Canada by
CRONAME (Canada) Ltd., Waterloo, Quebec*

*Tuttle
of
Adrian*

REPUBLIC STEEL PLANS

NEW ZINC PLATING PLANT

Plans have been made for a new \$4.5 million electrolytic zinc plating line at Republic Steel's Cleveland, O., steel plant for the production of Republic Electro Paintlok sheets, according to T. F. Patton, president.

NEW, LARGE TEXAS FACTORY BRANCH FOR DEVILBISS CO.

The Devilbiss Co. is expanding its direct factory branch in Dallas, Tex., and relocating in the Trinity Industrial District on Irving Blvd., a main artery be-

tween Dallas and Fort Worth, according to an announcement by Henry M. Kidd, vice president in charge of spray equipment sales.

YALE TO OPEN NEW PACIFIC COAST PLANT

A new Yale lift truck manufacturing plant, to serve the materials handling needs of industries located West of the Rocky Mountains, will be constructed at San Leandro, Calif., it is announced by Elmer F. Twyman, vice president, Yale & Towne Mfg. Co. The plant is expected to be completed early in 1957.

LEA EXPANDS FACILITIES

AS NEW BUILDING GROWS

The Lea Manufacturing Co., Waterbury, Conn., specialists in the applications of surface finishing methods, the manufacture of industrial abrasive finishing materials, and electrochemical processes, has occupied the third section of a large new plant they have been building on Aurora St. The new location will offer better shipping facilities and more efficient operation.

YARDLEY PLASTIC PURCHASES

AULD PLASTIC DIV.

The Yardley Plastics Co., Columbus, O., has purchased the Decorative Plastic Molding and Plastic Finishing Division of the D. L. Auld Co., also of Columbus, it has been announced. The move will give Yardley seven times the manufacturing capacity of the former Auld operation, and in turn will better the Auld firm's position in the metal products field. In full charge of Yardley's custom injection molding dept. will be James H. Hosmer, former vice president in charge of the Auld Plastic Division.

KAISER ALUMINUM APPOINTS

NEW WISCONSIN DISTRIBUTOR

Fullerton Metals of Wisconsin, Inc., Milwaukee, has been appointed a general line industrial distributor for Kaiser Aluminum products in that state, according to an announcement by S. S. Inch, vice president of Kaiser Aluminum & Chemical Sales, Inc. Fullerton Metals will carry a full line of Kaiser aluminum sheet, rod, bar, wire, and extruded shapes.

NEW BUILDING PLANNED FOR

SYLVANIA ELECTRIC COMPANY

Construction started recently at Towanda, Penn., on a new engineering and pilot production building for the Tungsten and Chemical Division of Sylvania Electric Products, Inc., New York, N.Y., according to Gerald L. Moran, chief engineer for the division. The three-story brick structure of 48,000 square feet will house engineering offices, laboratories, and pilot plant facilities for more than 100 scientists, engineers, and technicians. The company's Tungsten and Chemical Division is a major producer of germanium and silicon, key materials in the manufacture of transistors and other electronic devices. In its field, the division produces metal powder, rod, welding electrodes, and wire for light bulbs and electron tubes. The division also manufactures phosphors for fluorescent and TV tubes.

NOVEMBER • 1956 finish

PEOPLE AND EVENTS CONTINUED

Howard N. Wedelstaedt has recently joined United Wallpaper, Inc., Chicago, Ill., and will be assistant to B. A. Malm, vice president of operations.



Herb Tilton has been appointed to the sales staff of the National Rack Co., Paterson, N. J., according to a recent announcement. He will be the company's engineering consultant.

Neele S. Stearns has been elected vice president for planning and development, a newly-created post, of Inland Steel Co., Lemmuel B. Hunter has been elevated to the post of assistant to the president.

Donald W. Walker has been appointed foil product manager for Kaiser Aluminum & Chemical Sales, Inc.

ACME STEEL VOTES ISSUE OF 400,000 COMMON SHARES

A special meeting of shareholders of Acme Steel Co., held recently, resulted in approval to issue 400,000 shares of common stock for sale to the public. Proceeds from sale of the stock will be used for the purchase of the property and assets of Newport Steel Corp., Newport, Ky.

HONEYWELL PLANS ENTRY INTO ELECTRONIC AIR CLEANING FIELD

Minneapolis-Honeywell Regulator Co. plans to enter the electronic air cleaning field, Paul B. Wishart, president, has announced. The firm will work with Trion, Inc., McKees Rocks, Penn., and marketing activities are expected to begin in 1957. Manufacturing operations will be carried out at the Honeywell plant at Wabash, Ind.

HARVEY MACHINE CO. FORMS STRUCTURAL ALUMINUM DIV.

Formation of a new division, Harvey Aluminum Structures, to engineer, fabricate, and erect aluminum structures has been announced by officials of Harvey Machine Co., Inc., Torrance, Calif. Dr. J. Morley English, eminent structures authority, on leave from the the University of California at Los Angeles, has been appointed to organize the division.

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CHOICE OF LEADING APPLIANCE AND METAL PRODUCT MANUFACTURERS

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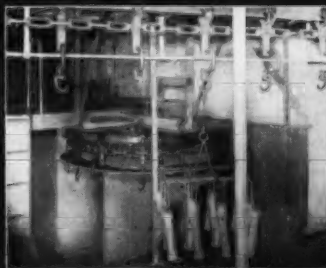


Left: Looking towards entrance end of ROSS Washer

Right: Interior of ROSS Flo-Coat Drip Tunnel

Below: Work leaving Washer to enter ROSS Dry-Off Oven

WASHING
PHOSPHATIZING
SPRAY
BOOTHS



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BAKING
CONVEYING

Complete Coordination Of All Components

For every step in the process from the phosphatizing to the drying, ROSS units embody the most advanced principles of design and construction. Besides being each correctly balanced for proper performance, ROSS units are carefully planned to save space, fuel, labor and maintenance. Your entire finishing line is installed by ROSS under a single responsibility for attaining desired results.

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KIRKLAND, ILLINOIS

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operation or years without accidents

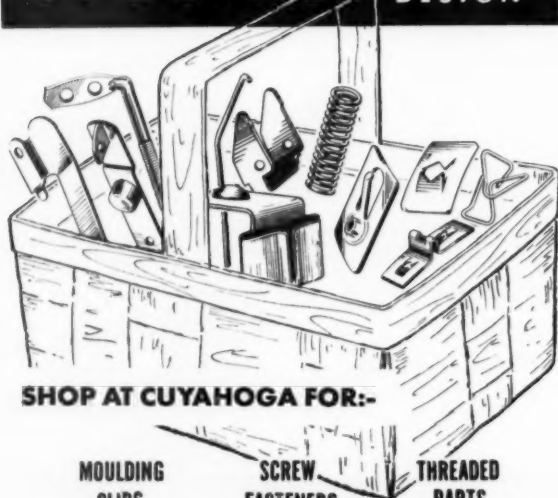


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IMAGINATION THE ANSWER, STATES ALCOA SPOKESMAN

"Aluminum products of the future must be styled with imagination," F. J. Close, manager of market development, Aluminum Co. of America, said recently before the Pacific Intermountain Conference of the Purchasing Agents' Assn. "We must recognize the fact that a product will not always sell itself on the strength of exceptional characteristics or quality of materials alone," Close added. He said that products should have "more eye appeal, through color, texture, and form, than the products now being made."

YOUNGSTOWN KITCHEN COLORS NOW AVAILABLE FROM STOCK

The three basic colors in which Youngstown Kitchen cabinets are finished are now available, thanks to the cooperation of six of the nation's largest paint companies. The colors, Dawn Yellow, Meridian Blue, and Sunset Copper, in addition to Star White, may be had in local paint stores handling Benjamin-Moore, DuPont, Glidden, Martin-Seymour, Pittsburgh, and Sherwin-Williams products.

LAMSON CORP. ANNOUNCES ORGANIZATION CHANGE

The Lamson Corp. of Delaware will, in the future, have two separate Sales and Engineering groups; namely, Engineered Systems and Allied Products, according to Robert I. Hicks, president of Lamson Corp., Syracuse, N. Y., operating subsidiary of the Lamson Corp. of Delaware. Carroll Hennessy, newly-elected vice president, will manage the Engineered Systems, and Allied Products will be managed by Vernon C. Story.

NEW ARMCO PRE-FAB BUILDING DIVISION NEARS COMPLETION

The new \$1,500,000 Middletown Fabricating Plant of Armco Drainage & Metal Products, Inc., now under construction, will manufacture a new type of prefabricated steel building, S. R. Ives, president, has announced. An addition to the company's present line of prefabricated steel buildings, the new design uses a cold formed steel truss which makes possible clear-span widths ranging from 60 to 100 feet. Ives announced that Glenn K. Thompson, formerly staff assistant at Armco Drainage's headquarters in Middletown, has been appointed superintendent of the new facility.

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AGAINST RUST... USE**

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Corrosion is the arch enemy of your product's paint finish... it is the direct cause of peeling, flaking and unsightly stains. With Paintbond you can effectively (and economically) foil the demon rust for a lifetime regardless of the conditions under which the product is normally used!

Paintbond is a zinc-iron phosphate coating, applied directly to the metal prior to painting. Applied by either dip or spray, Paintbond provides a moisture-proof fine-grain crystalline coating which is chemically interlocked with the metal surface. When paint is applied over it, the paint flows into the microscopic crevices between the crystals and is securely interlocked with the metal.

Paintbond thus puts an end to peeling and flaking, thoroughly seals the metal from moisture. Even when the paint is scratched through, Paintbond confines rust to the exposed metal only! No more spreading rust or ugly stains around the scratch.

Important, too, is the fact that Paintbond will impart a far more lustrous, attractive surface to your paint finish and thus increase sales appeal as well.

If you paint your product it will pay you to investigate the advantages of Paintbond. Mail the coupon below or call the nearest Detrex sales office for full particulars.

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**Easy to handle...
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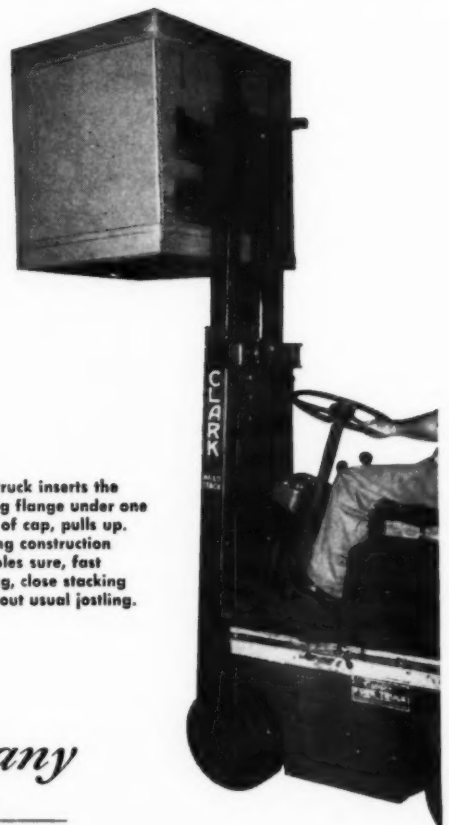
- Carton is designed for fast, easy assembly—cuts shipping room time.
- Special tube and cap design enables lift truck to handle easily.
- Interlocking flange cap provides grip for manual handling, necessary for large containers.
- Container can be opened without damage to contents, reclosed for further shipment.
- Dustproof construction assures factory-fresh arrival.
- Large, clean surfaces allow product identification and advertising.

If you have a problem in container design, write us for full details of our custom design service.

Cutaway container with top lifted. The all-corrugated packaging assures safe transit.



Lift truck inserts the lifting flange under one side of cap, pulls up. Strong construction enables sure, fast lifting, close stacking without usual jostling.



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editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

published monthly as special section of finish — the magazine of appliance and metal products manufacturing

Safe Transit Certifications on the Increase

release list of companies who have had their product and package approved according to NST specifications and can use "Reduce Shipping Costs" label

The following companies and laboratories have now been certified under the National Safe Transit program it has been announced by the Washington, D. C. office.

Ace Utilities, Inc.
 Brooklyn, New York

Ackermann Manufacturing Co.
 Wheeling, West Virginia

Acme Industries, Inc.
 Jackson, Michigan

Active Tool & Mfg. Co.
 Detroit, Michigan

Admiral Corp.
 Chicago, Illinois

Aircapitol Mfrs., Inc.
 Wichita, Kansas

AllianceWare, Inc.
 Alliance, Ohio

Allis-Chalmers Mfg. Co.
 Gadsden, Alabama

Allis-Chalmers Mfg. Co.
 Pittsburgh, Pennsylvania

Altorfer Bros. Co.
 Peoria, Illinois

Amana Refrigeration, Inc.
 Amana, Iowa

America & Southern Corp.
 Nashville, Tennessee

American Kitchens Division
 AVCO Manufacturing Corp.
 Connersville, Indiana

Anchor Division
 Stratton & Terstegge Co.
 New Albany, Indiana

Andrew Corp.
 Chicago, Illinois

Apex Electrical Mfg. Co.
 Cleveland, Ohio

Argus Cameras, Inc.
 Ann Arbor, Michigan

Automatic Washer Co.
 Newton, Iowa

Bay State Abrasive Products Co.
 Westboro, Massachusetts

Beam Mfg. Co.
 Webster City, Iowa

Bee Line Co.
 Davenport, Iowa

The Belmont Co.
 Division of Ridge Tool Co.
 New Philadelphia, Ohio

Belvidere Products, Inc.
 Belvidere, Illinois

Ben-Hur Mfg. Co.
 Milwaukee, Wisconsin

Bryant Heater Division
 Carrier Corp.
 Indianapolis, Indiana

Bryant Heater Division
 Carrier Corp.
 Tyler, Texas

Buckeye Aluminum Division
 Mardigan Corp.
 Wooster, Ohio

Calcinator Corp.
 Bay City, Michigan

Caloric Appliance Corp.
 Topton, Pennsylvania

Canadian General
 Electric Co., Ltd.
 Montreal, Quebec

Canadian Westinghouse Co., Ltd.
 Hamilton, Ontario

Central Rubber & Steel Corp.
 Findlay, Ohio

Challenge Stamping &
 Porcelain Co.
 Grand Haven, Michigan

Chambers Manufacturing Corp.
 Oxford, Mississippi

Chicago Electric Division
 The Silex Co.
 Chicago, Illinois

Chicago Vitreous Corp.
 Cicero, Illinois

Chrysler Corp.
 Airtemp Division
 Dayton, Ohio

Cincinnati Milling Products Div.
 Cincinnati Milling Machine Co.
 Cincinnati, Ohio

Clarostat Manufacturing Co., Inc.
 Dover, New Hampshire

Berger Mfg. Division
 Republic Steel Corp.
 Canton, Ohio

Bettcher Mfg. Corp.
 Cleveland, Ohio

Boston Stove Foundry Co.
 Reading, Massachusetts

Brown Stove Works, Inc.
 Cleveland, Tennessee

Cale Steel Equipment Co., Inc.
 New York, N. Y.

The Coleman Co., Inc.
 La Porte Division
 La Porte, Indiana

Canlon-Moore Corp.
 Joliet, Illinois

Consolidated Industries, Inc.
 Lafayette, Indiana

Continental Water Heater Co.
 Los Angeles, California

Cribben & Sexton Co.
 Chicago, Illinois

Crosley-Bendix Division
 AVCO Manufacturing Corp.
 Cincinnati, Ohio

Crosley-Bendix Division
 AVCO Manufacturing Corp.
 Nashville, Tennessee

Crown Stove Works
 Chicago, Illinois

Crunden Martin Mfg. Co.
 St. Louis, Missouri

Davis Products Co.
 Niles, Michigan

Day & Night Division
 Carrier Corp.
 Monrovia, California

Decatur Pump Co.
 Decatur, Illinois

Diebold, Inc.
 Canton, Ohio

NATIONAL SAFE TRANSIT CERTIFICATIONS CONTINUED

Ditto, Inc.
Chicago, Illinois

Dixie Products, Inc.
Cleveland, Tennessee

The Dortch Stove Works, Inc.
Franklin, Tennessee

Dostal & Lowey Co., Inc.
Menomonee Falls, Wisconsin

Douglas-Eaton Chair Co.
Eaton, Indiana

Duo-Therm Division
Motor Wheel Corp.
Lansing, Michigan

Eagle Range & Mfg. Co.
Belleville, Illinois

Easy Washing Machine Corp.
Syracuse, New York

The Enamel Products Co.
Cleveland, Ohio

Fairbanks, Morse & Co.
Kansas City, Kansas

Fairbanks, Morse & Co.
Westco Works
St. Louis, Missouri

Fairbanks, Morse & Co.
St. Johnsbury, Vermont

Fedders-Quigan Corp.
Buffalo, New York

Fedders-Quigan Corp.
Maspeth, Long Island, N. Y.

Federal Enameling & Stamping Co.
Pittsburgh, Pennsylvania

Firestone Steel Products Co.
Akron, Ohio

The Fletcher Enamel Co.
Dunbar, West Virginia

Florence Stove Co.
Kankakee, Illinois

Florence Stove Co.
Lewisburg, Tennessee

Fogel Refrigerator Co.
Philadelphia, Pennsylvania

Foster Refrigerator Corp.
Hudson, New York

Franklin Manufacturing Co., Inc.
Minneapolis, Minnesota

Fresh'nd-Aire Co.
Division of Cory Corp.
Chicago, Illinois

Frigidaire Division
General Motors Corp.
Dayton, Ohio

General Electric Co.
Bloomfield, New Jersey

General Electric Co.
Erie, Pennsylvania

General Electric Co.
Dishwasher & Disposall Dept.
Louisville, Kentucky

General Electric Co.
Home Laundry Department
Louisville, Kentucky

General Electric Co.
Household Refrigerator Dept.
Louisville, Kentucky

General Electric Co.
Range & Water Heater Dept.
Louisville, Kentucky

General Electric Co.
Room Air Conditioner Dept.
Louisville, Kentucky

General Electric Co.
High Voltage Switchgear Dept.
Philadelphia, Pennsylvania

Geneva Modern Kitchens
Division of Acme Steel Co.
Geneva, Illinois

Glenco Refrigeration Corp.
Philadelphia, Pennsylvania

Globe American Corp.
Kokomo, Indiana

Gray & Dudley Co.
Nashville, Tennessee

Hardwick Stove Co., Inc.
Cleveland, Tennessee

Haskell Mfg. Co., Inc.
Pittsburgh, Pennsylvania

Heintz Mfg. Co.
Philadelphia, Pennsylvania

Hillside Metal Products, Inc.
Newark, New Jersey

The Hobart Mfg. Co.
Louisville, Kentucky

Hotpoint Co.
Chicago, Illinois

Hough Mfg. Corp.
Janesville, Wisconsin

Humphries Mfg. Co.
Mansfield, Ohio

Ideal Dispenser Co.
Bloomington, Illinois

Ingersoll Products Division
Borg-Warner Corp.
Chicago, Illinois

Ingram-Richardson, Inc.
Frankfort, Indiana

International Harvester Co.
Evansville, Indiana

International Harvester Co.
Richmond, Indiana

Jordan Refrigerator Co., Inc.
Philadelphia, Pennsylvania

Kaiser Metal Products, Inc.
Bristol, Pennsylvania

Kelvinator Division
American Motors Corp.
Grand Rapids, Michigan

Kelvinator of Canada Ltd.
London, Ontario

Kreonite, Inc.
Wichita, Kansas

Kresky Mfg. Co., Inc.
Petaluma, California

Kuehne Mfg. Co.
Mattoon, Illinois

Lakeside Mfg., Inc.
Milwaukee, Wisconsin

Lawson Mfg. Co.
New Kensington, Pennsylvania

Leeds & Northrup Co.
Philadelphia, Pennsylvania

Lennox Industries, Inc.
Marshalltown, Iowa

Lewyt Air Conditioner Corp.
Brooklyn, New York

A. J. Lindemann & Hoverson Co.
Milwaukee, Wisconsin

Line Material Co.
Division of McGraw Electric Co.
Milwaukee, Wisconsin

Lisk-Savory Corp.
Canandaigua, New York

H. C. Little Burner Co., Inc.
San Rafael, California

Locke Stove Co.
Kansas City, Missouri

Logan Engineering Co.
Chicago, Illinois

Lovell Mfg. Co.
Erie, Pennsylvania

Luxra Co.
Atchison, Kansas

McCray Refrigerator Co., Inc.
Kendallville, Indiana

A. Y. McDonald Mfg. Co.
Dubuque, Iowa

McGraw Electric Co.
Lonergan Mfg. Division
Albion, Michigan

Magic Chef, Inc.
St. Louis, Missouri

Magic Chef, Inc.
Cleveland, Ohio

Majestic Mfg. Co.
St. Louis, Missouri

Malleable Iron Range Co.
Beaver Dam, Wisconsin

Malsbary Mfg. Co.
Oakland, California

Manitowoc Equipment Works
Manitowoc, Wisconsin

The Maytag Co.
Newton, Iowa

Miami Products, Inc.
Miami, Oklahoma

Midwest Mfg. Corp.
Division of Admiral Corp.
Galesburg, Illinois

Mission Appliance Corp.
Hawthorne, California

Mitchell Mfg. Co.
Chicago, Illinois

Moffats Limited
Weston, Ontario

The Moore Enameling & Mfg. Co.
West Lafayette, Ohio

Morrison Steel Products, Inc.
Buffalo, New York

Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Illinois

Murray Corp. of America
Scranton, Pennsylvania

Murray Mfg. Co.
Murray, Kentucky

Neon Products, Inc.
Lima, Ohio

Nesco, Inc.
Jacksonville, Illinois

Newark Stove Company
Newark, Ohio

Norge Division
Borg-Warner Corp.
Effingham, Illinois

Norge Division
Borg-Warner Corp.
Herrin, Illinois

Norge Division
Borg-Warner Corp.
Muskegon Heights, Michigan

The Ohio Foundry & Mfg. Co.
Steubenville, Ohio

The C. A. Olsen Mfg. Co.
Elyria, Ohio

Ortman-McCain Co.
Chicago, Illinois

Payne Furnace Division
Carrier Corp.
Monrovia, California

Peerless Mfg. Corp.
Louisville, Kentucky

Penn Ventilator Co.
Philadelphia, Pennsylvania

Perfection Stove Co.
Cleveland, Ohio

Philco Corp.
Dexter Division
Fairfield, Iowa

Philco Corp.
Philadelphia, Pennsylvania

Philco Corp.
Mt. Clemens, Michigan

Plastic Fabricating Co., Inc.
Wichita, Kansas

The Permutit Co.
Birmingham, New Jersey

Plumbingware Mfg. Co.
Chicago, Illinois

Porcelain Metals Corp. of Louisville
Louisville, Kentucky

Precision Grinding Wheel Co., Inc.
Philadelphia, Pennsylvania

Preway, Inc.
Wisconsin Rapids, Wisconsin

Pryne & Company
Pomona, California

Quicfrez, Inc.
Fond du Lac, Wisconsin

Quincy Stove Manufacturing Co.
Quincy, Illinois

Ranney Refrigerator Co.
Greenville, Michigan

Raytheon Mfg. Co.
Brighton, Massachusetts

Raytheon Mfg. Co.
Waltham, Massachusetts

Reda Pump Co.
Bartlesville, Oklahoma

The Reliance Electric & Engineering Co.
Ashtabula, Ohio

Remington Corp.
Auburn, New York

Revco, Inc.
Deerfield, Michigan

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Rockford, Illinois

Rowe Spacarb, Inc.
Stamford, Connecticut

Milton Roy Co.
Philadelphia, Pennsylvania

Royal Electric Mfg. Co.
Chicago, Illinois

Royal Typewriter Co., Inc.
Hartford, Connecticut

Ruud Mfg. Co.
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Samuel Stamping & Enameling Co.
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Wichita, Kansas

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Buffalo, New York

Sylvania Electric (Canada) Ltd.
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Tappan Stove Co.
Mansfield, Ohio

Temco, Inc.
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Thor Corp.
Chicago, Illinois

Thor Corp.
Meadows Division
Bloomington, Illinois

Toledo Porcelain Enamel Products Co.
Toledo, Ohio

Torrington Mfg. Co.
Torrington, Connecticut

United Specialties Co.
Philadelphia, Pennsylvania

United States Rubber Co.
Fort Wayne, Indiana

United States Stamping Co.
Moundsville, West Virginia

The Vendo Co.
Kansas City, Missouri

Victor Products Corp.
Hagerstown, Maryland

Victory Metal Mfg. Corp.
Plymouth Meeting, Pennsylvania

Welbilt Corp.
Maspeth, Long Island, N. Y.

Welbilt Corp.
Detroit Division
Detroit, Michigan

Wells-Gardner & Co.
Chicago, Illinois

Westinghouse Electric Corp.
Air Arm Division
Baltimore, Maryland

Westinghouse Electric Corp.
X-Ray Division
Baltimore, Maryland

Westinghouse Electric Corp.
East Springfield, Massachusetts

Westinghouse Electric Corp.
Metuchen, New Jersey

Westinghouse Electric Corp.
Buffalo, New York

Westinghouse Electric Corp.
Raleigh, North Carolina

Westinghouse Electric Corp.
Columbus, Ohio

Westinghouse Electric Corp.
Mansfield, Ohio

Westinghouse Electric Corp.
Beaver, Pennsylvania

Westinghouse Electric Corp.
Sharon, Pennsylvania

Westinghouse Electric Corp.
Pittsburgh, Pennsylvania

Westinghouse Electric Corp.
Staunton, Virginia

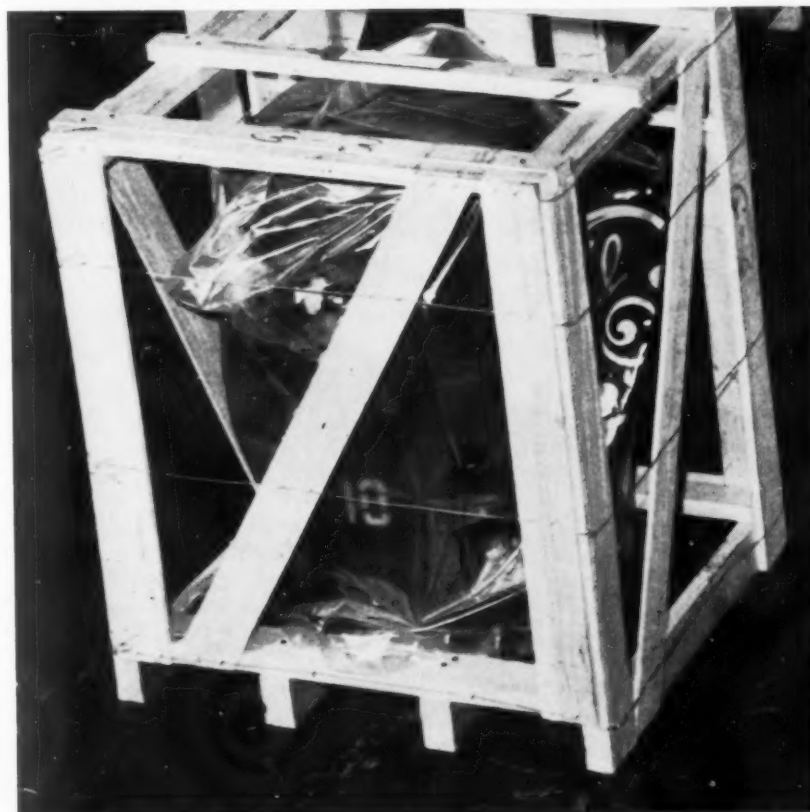
Whirlpool-Seeger Corp.
Evansville, Indiana

Whirlpool-Seeger Corp.
Clyde, Ohio

Whirlpool-Seeger Corp.
St. Paul, Minnesota

to Page 94 →

Growing Possibilities for Polyethylene Usage



USE OF POLYETHYLENE for product protection is just gaining its proper position in regard to the larger units. Use of polyethylene sheet as protection against moisture, etc., and of polyethylene bags for full sealed protection is best exemplified in the above photo which won a national award in packaging for General Electric.

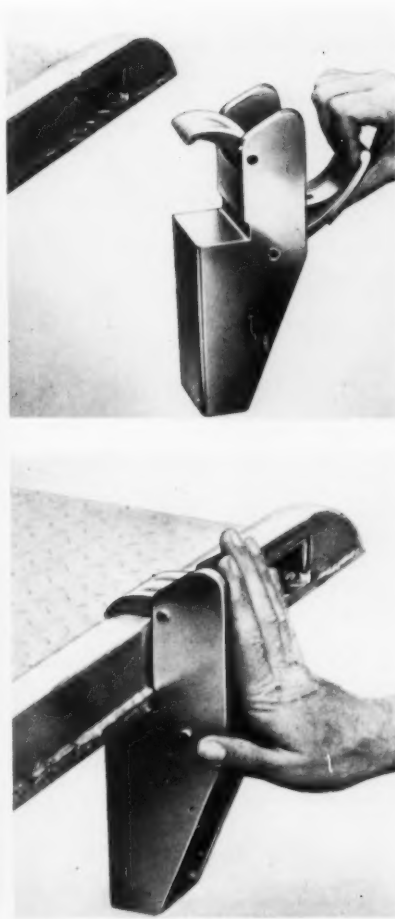
If you pack, handle or
warehouse packaged goods
... you need this booklet



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BOXES AND CRATES

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New safety-lock feature for dock bridges

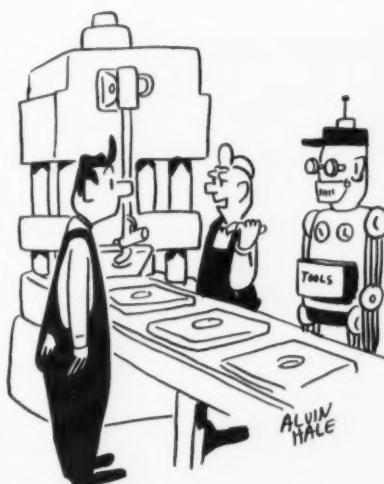
adjustable safety unit clamps onto ends of dock bridge unit, locking it into slip-proof position between dock and carrier

An adjustable device which helps lock dock bridges in position between dock and rail car, or dock and truck, has been introduced. Simple and easy to use, the units can be positioned and repositioned to meet varying dock-to-carrier span requirements without need for tools, according to the manufacturer. An easy pull on a lever arm opens the jaws of the unit, and permits positioning it at the edge of the loading dock. A firm push against the lever arm locks the unit's jaws to the dock bridge safety curb. The bottom of the lock extends down into the span between dock and carrier, and fits flush against the edge of the dock.

Normally, the units are used in pairs—one on each safety curb. In a typical

loading dock operation, the dock bridge is placed in position with the floor member flush against the edge of the carrier. Then the Span-Locks are locked into position flush against the edge of the dock. This two-way locking action prevents the board from slipping in either direction.

According to the manufacturer, the new device is the only board-locking device which can be positioned exactly where required for slip-proof operation under all possible dock-to-carrier span variations; the only locking device which locks in a positive manner, thus minimizing the possibility of bouncing out of position during loading and unloading.



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Southern Methodist University
School of Engineering
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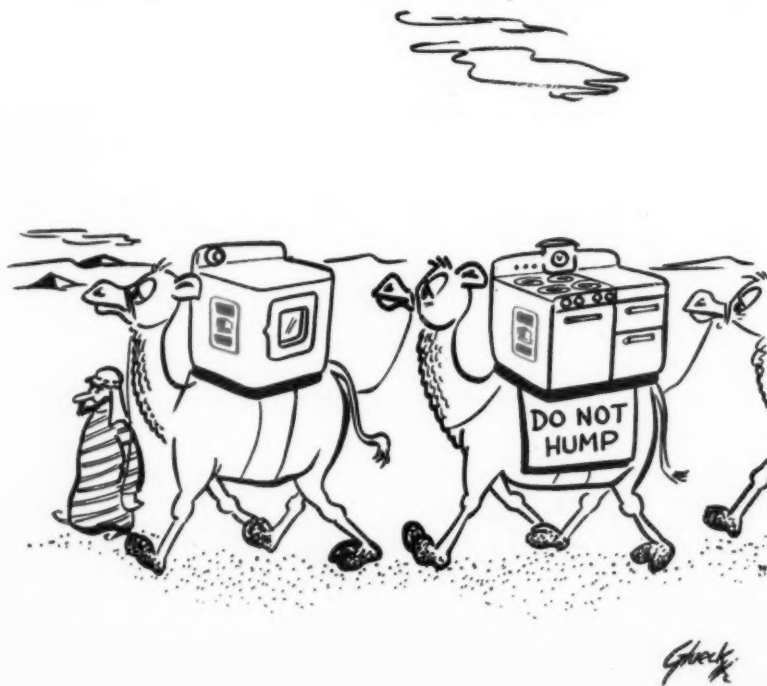
Laboratories in Canada

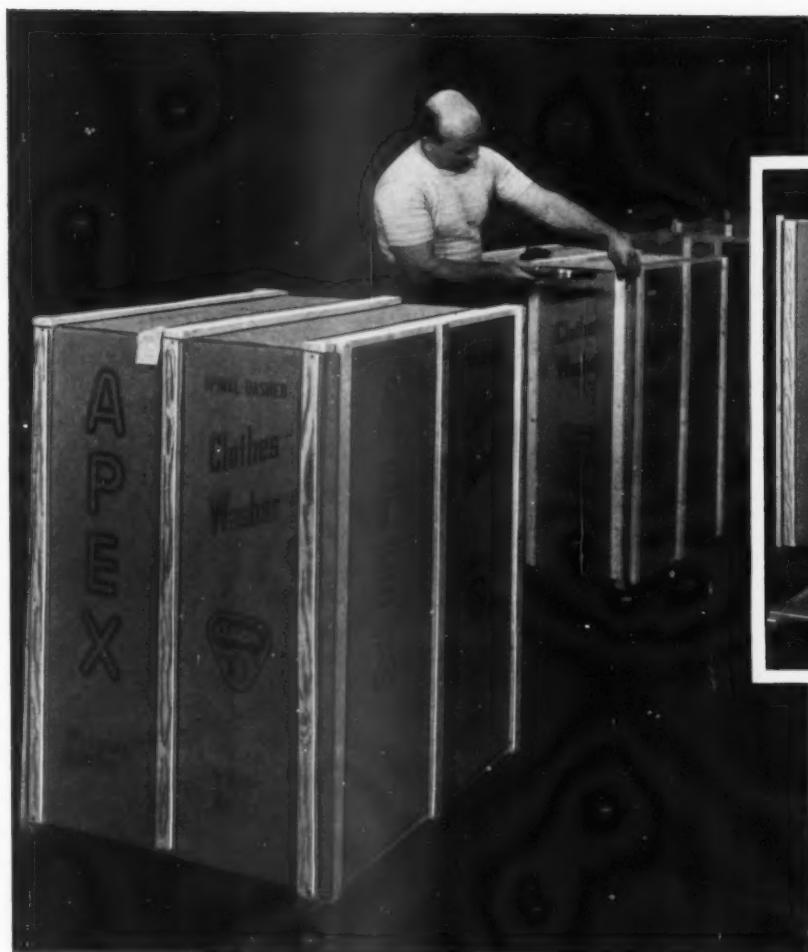
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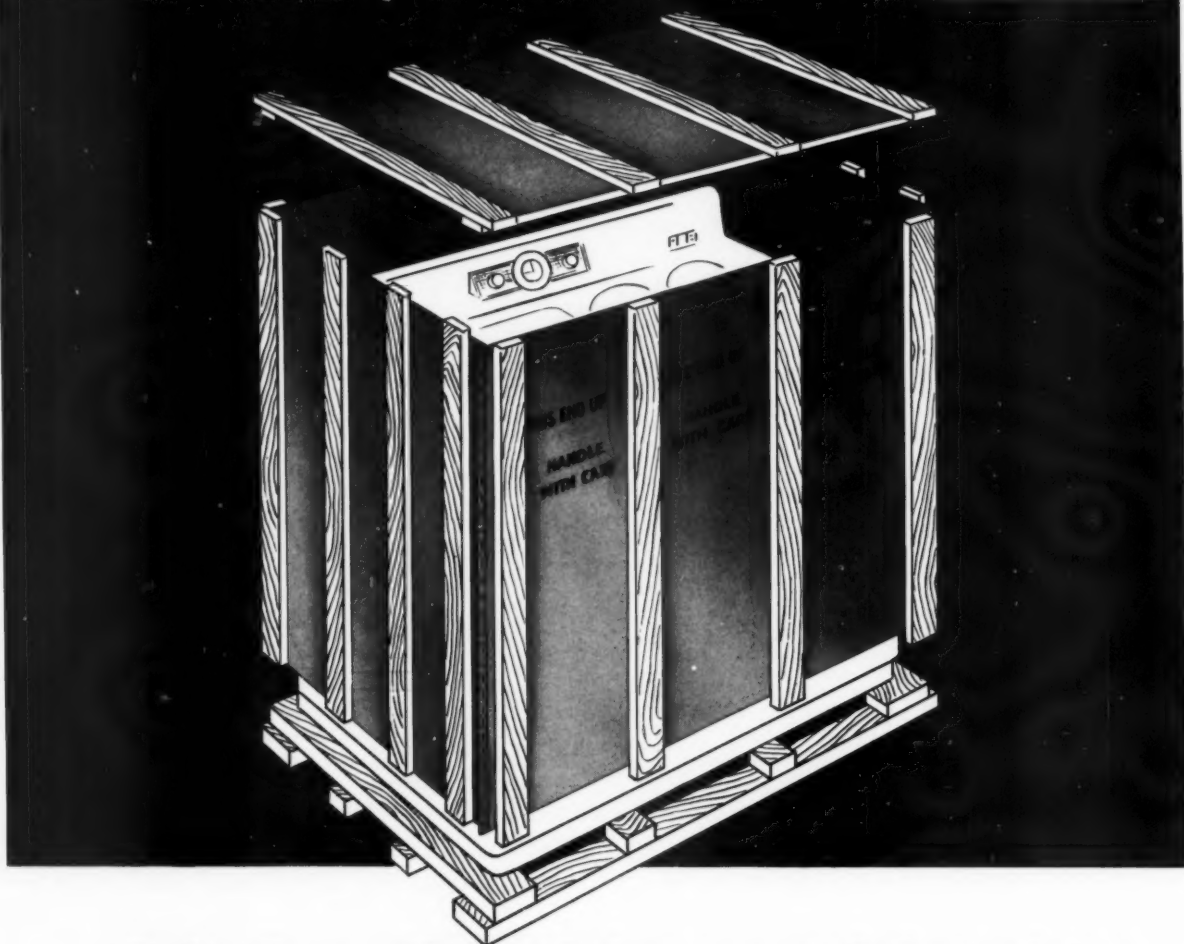
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TRANE PRESIDENT LISTS AID PROGRAM AS MANAGEMENT MUST

Referring specifically to his company's scholarship and fellowship program as a modern management must, D. C. Minard, president, The Trane Co., La Crosse, Wisconsin, took note today of "industry's spiralling need for engineers." He emphasized that the critical situation should be given increased consideration by industrial leaders and educators alike. Noting the needs of his own company, the air conditioning and heating executive pointed out that one in every four office employees at Trane is an engineer. He said, "Since 1950, the number of our research and development personnel has increased by more than five times, and we see even greater need for qualified engineers to meet our projected planning for the years ahead."

KELVINATOR HOME ECONOMIST RETIRES AS DIRECTOR OF KIBL

One of the nation's leading home economist's, whose 40-year career has spanned the development of all today's modern appliances, retired as director of the Kelvinator Institute of Better Living. Miss Karen Fladoes, chief Kelvinator home economist since 1944, was a young home economist teacher just out of Stout Institute in her home town of Menomonie, Wis., when the electric range appeared on the market. She was teaching homemakers how to turn out better baked goods for a Minneapolis flour company when household refrigeration appeared on the American scene. She has since seen home freezers, automatic washers and dryers, garbage disposers, and dishwashers come into widespread use.

BRYANT PICKS ART STUDENT TO PAINT MURAL FOR ADDITION

Carol Yattaw, art student at the Art School of the John Herron Art Institute, has been commissioned by Bryant Manufacturing Co., Indianapolis, Ind., to paint a giant mural for the firm's new administration and engineering research building nearing completion. Ronald N. Campbell, Bryant president, selected Miss Yattaw's sketch as the best in a class project among third year art students. The mural, which will measure seven feet in height and eighteen feet in width, will hang in the lobby of the new building, and will depict man's struggle, since prehistoric days, to heat and cool his dwelling place.

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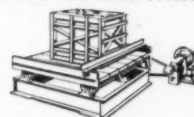


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DEVELOP NEW PACKAGE FOR SHIPMENT OF GAS HEATERS

With the development of a new fibre box, gas heaters, with or without radiants, may now be shipped in conformance with the Uniform and Consolidated Freight Classifications, it has been announced. The new package, designated as package 1131 in the classifications, is described as a double faced corrugated fibreboard box. The packaged heater rests in a double wall corrugated tray which is so scored and folded that the article rests on two thicknesses of the fibreboard. At least an inch of clearance is maintained between the contents and the container top and sides by forms of built-up fibreboard. Finished surfaces of the heater which come in contact with the fibreboard forms are safeguarded by either non-abrasive material or protective paraffin coating on the fibreboard forms themselves. The classification specifies that the box may be used where package weights gross up to 135 pounds, and where inside dimensions of the box will not exceed 100 united inches. The metal and metal products industry is the second largest industry user of fibreboard.

CONTAINER LABORATORIES ACQUIRE NEW BRANCH

Container Laboratories, Inc., has acquired the facilities and equipment of Packaging Service Co., formerly owned by the Pennsylvania Box and Lumber Co., located at Willow Grove, a suburb of Philadelphia, Penn., according to an announcement by Allyn C. Beardsell, president. E. E. Janda, formerly of the New York division staff, will be branch manager. Philip S. Langey, formerly with Packaging Service Co., will be laboratory supervisor, and J. W. Andrew, a field engineer on the New York staff, will serve in the same capacity for the Philadelphia branch.

ANNOUNCE OWENS-ILLINOIS NATIONAL CONTAINER MERGER

Merger of Owens-Illinois Glass Co. and National Container Corp. was announced recently. Owens-Illinois is the surviving company. Samuel Kipnis, former president and director of National Container, becomes a member of the board of directors of Owens-Illinois. Hugh C. Laughlin, O-I executive vice president and director, has been named president of National Container Mill Division of the company.



Here's a Gaylord "package" of six corrugated boxes — containing sets of controls for home laundry dryers.

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SEVEN LEADERS IN METALS FIELD SIGNALLY HONORED

Seven leaders in the metals field were honored recently by the American Society for Metals with awards which recognize contributions resulting in great metal progress over the years. The awards were presented during the 38th National Metal Exposition and Congress, Cleveland, O. Those honored were: Edgar H. Dix, Jr., Aluminum Co. of America, Pittsburgh, Penn.; William H. Eisenman, American Society for Metals, Cleveland, O.; Charles M. White, Republic Steel Corp.; Dr. Alexander R. Troiano, Case Institute of Technology, Cleveland, O.; Dr. William J. Barnett, General Electric Co., Evendale, O.; Dr. Richard P. Fromberg, North American Aviation Corp., Downey, Calif.; and Dr. Ernest P. Nippes, Rensseler Polytechnic Institute, Troy, N. Y.

ARMCO, GERMAN STEEL FIRM CONCLUDE JOINT AGREEMENT

Details of an agreement between the Armco International Corp., Middletown, Ohio, and August Thyssen-Huette A. G., Duisberg-Hamborn, Germany, to form a joint steel fabricating company were disclosed recently by officials of the two companies. This action marks the first time that an American company has invested capital in the German steel industry and, for Armco, it will be its only foreign operation under joint ownership. Headquarters for the new company will be at Dinslaken, in the Ruhr valley, and the investment will amount to more than \$500,000. Using processes developed by Armco, the firm will fabricate specialty steel products, with initial plans calling for the production of highway guard rail and drainage pipe for road, railway, and agricultural use.

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